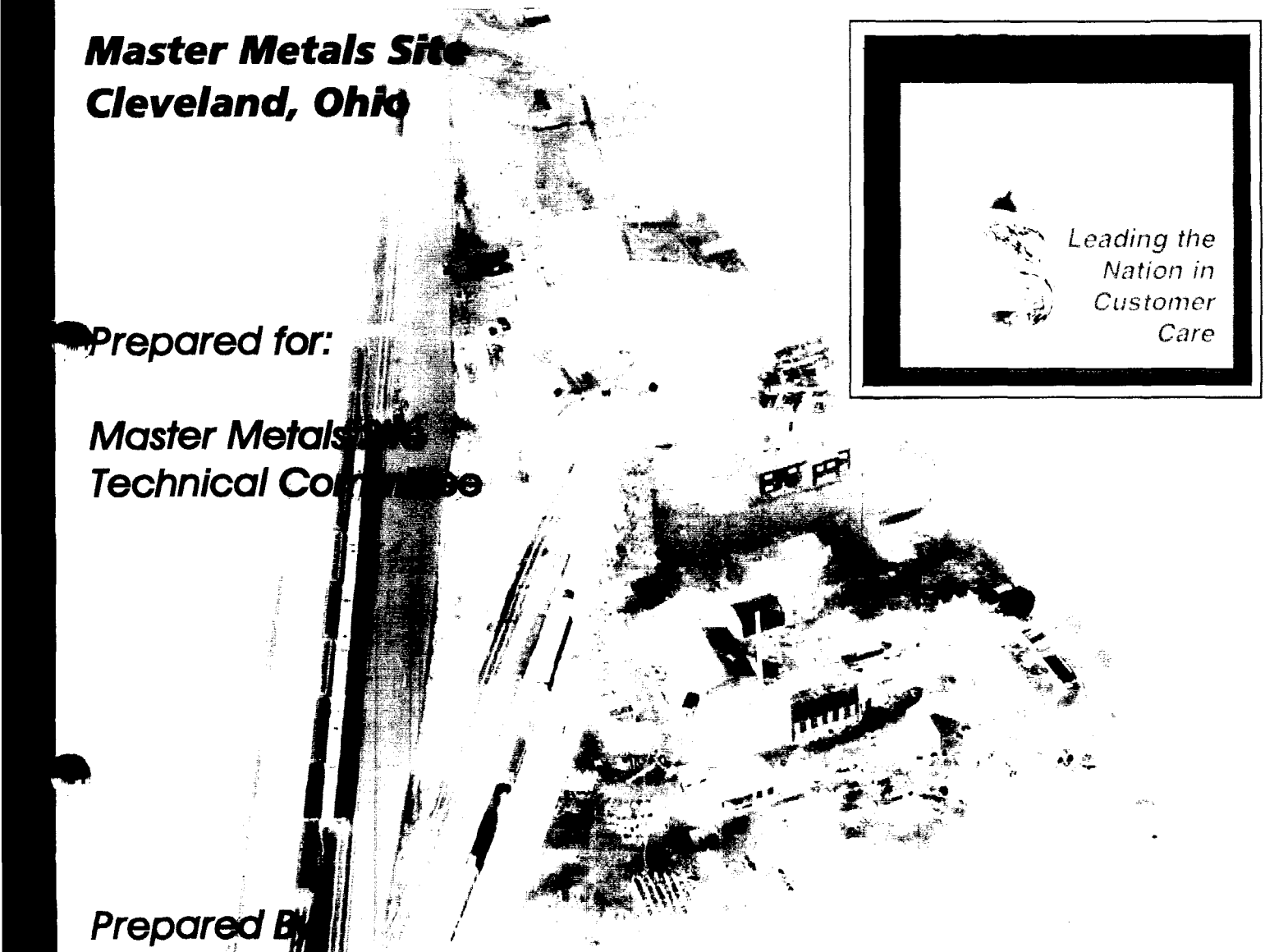
PHASE I TIME-CRITICAL REMOVAL ACTION WORKPLAN

Master Metals Site
Cleveland, Ohio

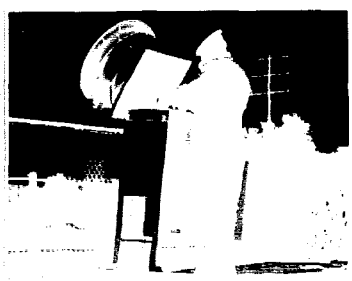


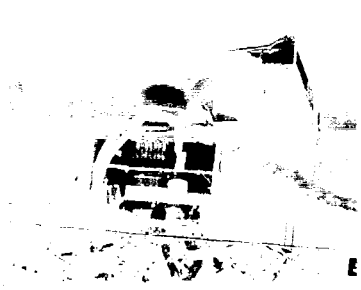
Prepared for:

Master Metals Site
Technical Committee

Prepared By:

ENTACT, Inc.
May 13, 1997





PHASE I TIME-CRITICAL REMOVAL ACTION WORKPLAN

ENTACT

Master Metals Site
Cleveland, Ohio

Prepared for:

Master Metals Site
Technical Committee

Prepared By:

ENTACT, Inc.
May 13, 1997

1360 North Wood Dale Road Suite A Wood Dale, Illinois 60191 Phone (630) 616-2100

PHASE I TIME-CRITICAL REMOVAL ACTION WORKPLAN

for the

MASTER METALS SITE

Cleveland, Ohio

May 13, 1997

ENTACT

Table of Contents

1.0 INTRODUCTION

This Phase I Work Plan addresses the time-critical removal actions, as outlined in the Administrative Order By Consent Pursuant to Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9606 (a) (Order), for the Master Metals, Inc. (MMI) facility. Specifically, the MMI facility located at 2850 W. Third Street in Cleveland, Ohio (the "Facility").

The following Phase I Work Plan will outline the time-critical removal actions at the MMI Facility in accordance with the Order.

1.1 Site Description

The MMI Facility, located at 2850 W. Third Street in Cleveland, Ohio, occupies approximately 4.3 acres of land in the "flats" area of downtown Cleveland, in a heavily

industrialized area (Figure 1.2). It is bordered on two sides by railroad tracks and an LTV Steel facility is located to the east and south. The Cuyahoga River is located approximately 1,500 feet to the east. The nearest residential area is approximately 0.5 miles to the northwest. Access to the MMI Facility is provided from W. Third Street at the northeast corner of the MMI property.

Major features at the Site include: the office building, the furnace building, two baghouses for the furnaces and a large brick baghouse, storage buildings, and several debris and material storage areas.(Figure 1.3) In addition, an aboveground storage tank farm is located at the northeast corner of the property. Reportedly, these ASTs are located in a concrete secondary containment structure and were utilized for storage of petroleum hydrocarbons for facility vehicles and equipment.

1.2 Site History

According to the Order, operations at the property were initiated in 1932 with the construction of facility buildings on slag and other fill materials. The facility was operated as a secondary lead smelter, producing lead alloys from lead-bearing dross and lead scrap materials, including battery cracking as part of its operations.

MMI purchased the Facility in 1979. MMI thereafter continued to run the Facility as a secondary lead smelter, receiving lead-bearing materials from off-site sources. In its operations, MMI used rotary and pot furnaces to convert these lead-bearing materials into lead ingots. Each furnace utilized by MMI contained a baghouse, a pollution screening structure that collected particulate matter from the furnace. By-products from the smelting operation included furnace flux, slag, dross, baghouse fines and furnace sludge. Excluding slag, most of the material was recycled back into the furnaces. Slag was tested and disposed of off-site. Finished lead ingots were stored in the roundhouse at the north end of the property prior to shipment off-site.

In July 1992, U.S. EPA contracted with an outside technical assistance team ("TAT") to collect soil/fill samples on and around the Facility property to determine if the Facility contaminants were subject to airborne transport. Analysis of these samples for RCRA metals and Toxicity Characteristic Leachate Procedure ("TCLP") metals revealed TCLP lead was present in concentrations greater than the RCRA regulatory level of 5mg/l. Facility soil samples also indicated the presence of TCLP arsenic and cadmium.

On August 5, 1993, the Ohio EPA director ordered MMI to cease operating the Facility until it could demonstrate compliance. On March 28, 1995, U.S. EPA's RCRA Division deferred the Master Metals Site to CERCLA for Cleanup. In an August 22, 1995 letter, MMI withdrew all permits still in effect regarding its operation, effectively

terminating its ability to legally treat, store or dispose of hazardous waste at the facility.

Throughout 1995 and 1996, vandals and scavengers visited the Facility on an intermittent basis. Further, in 1995 or 1996, MMI partially demolished one of the Facility structures, leaving piles of rubble, girders and sheet metal standing around the structure's remains.

Additional site history information is also contained within the Order Provided in Appendix A.

1.3 Phase I Scope of Work

The following documents have been prepared and submitted to detail the Phase I time- critical removal actions, the associated health and safety protocols, and the quality assurance procedures:

- Phase I Work Plan;
- Phase I Quality Assurance Project Plan (Appendix B, Book 2)
- Phase I Health and Safety Plan (Appendix C, Book 2)

The scope of work for Phase I will involve:

- Long-term securing of the Facility against trespassers through use of fences, signs and other devices, as necessary.
- Analysis and mapping of waste materials and contamination at the Facility for removal purposes;
- Excavation, demolition, consolidation, and /or removal of contaminated buildings, structures, soils, loose waste materials, loose industrial by-products, construction materials, demolition debris, machinery, garbage, dusts, post industrial debris and office or industrial equipment.

- Removal of drums, barrels, tanks, or other bulk containers that contain or may contain hazardous substances of pollutants or contaminants where such actions will reduce the likelihood of spillage or exposure.

- Containment, treatment, disposal, or incineration of hazardous materials, where such action is necessary to reduce the likelihood of exposure.

1.4 Phase I Project Schedule

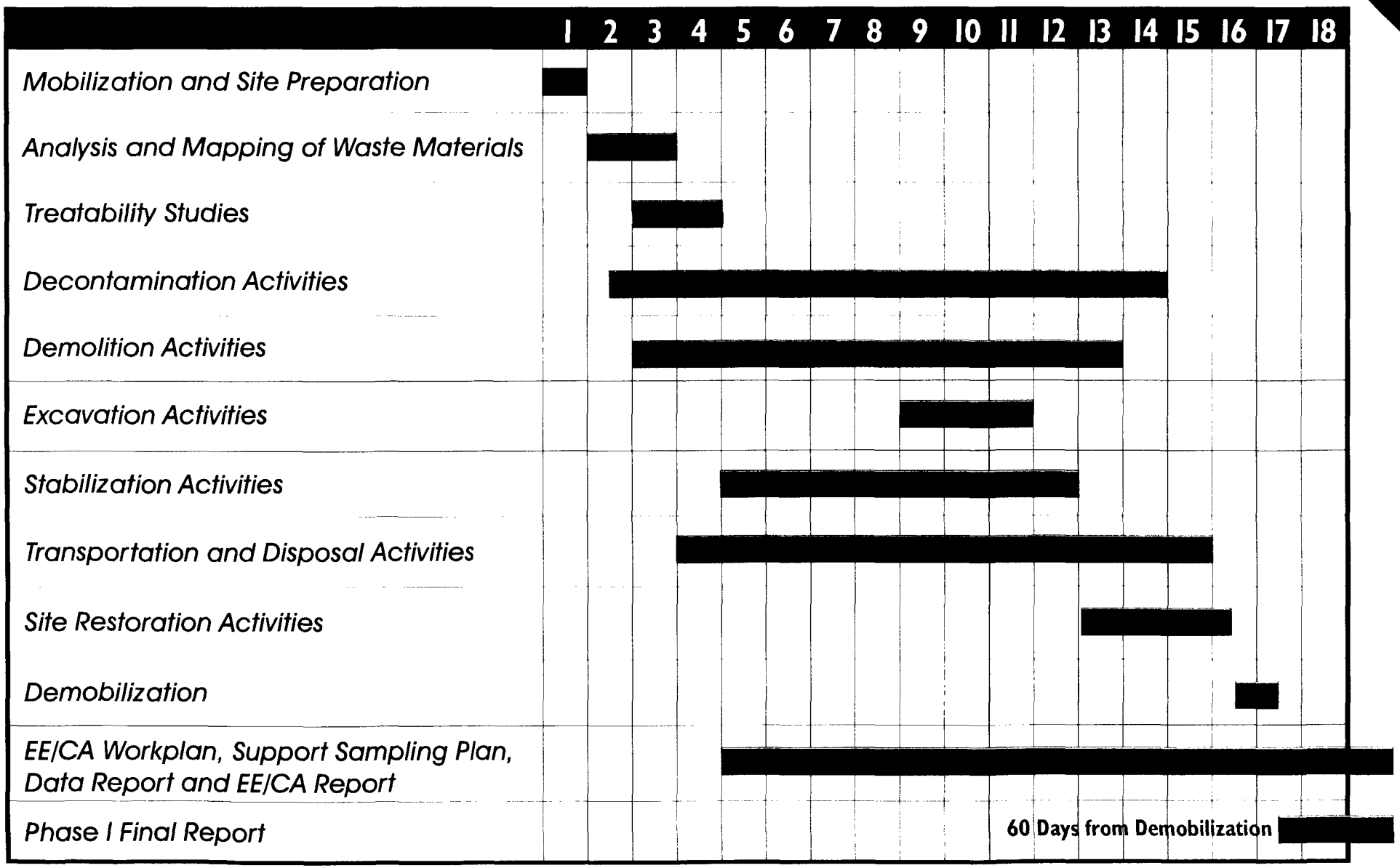
A project schedule has been prepared to include all Phase I items required by the Order. The project schedule, included in this section (Figure 1.1), is an approximation of the time required to complete Phase I activities based on estimations of volume of contamination. If actual volumes differ significantly from estimated volumes, the schedule may be modified accordingly.

MASTER METALS
Cleveland, Ohio

Figure 1.1

PROJECTED SCHEDULE OF PHASE I ACTIVITIES

ENTACT
May 13, 1997



SITE LOCATION MAP

ENTACT
Leading the Nation in Customer Care

CLEVELAND SOUTH QUADRANGLE OHIO-CUYAHOGA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

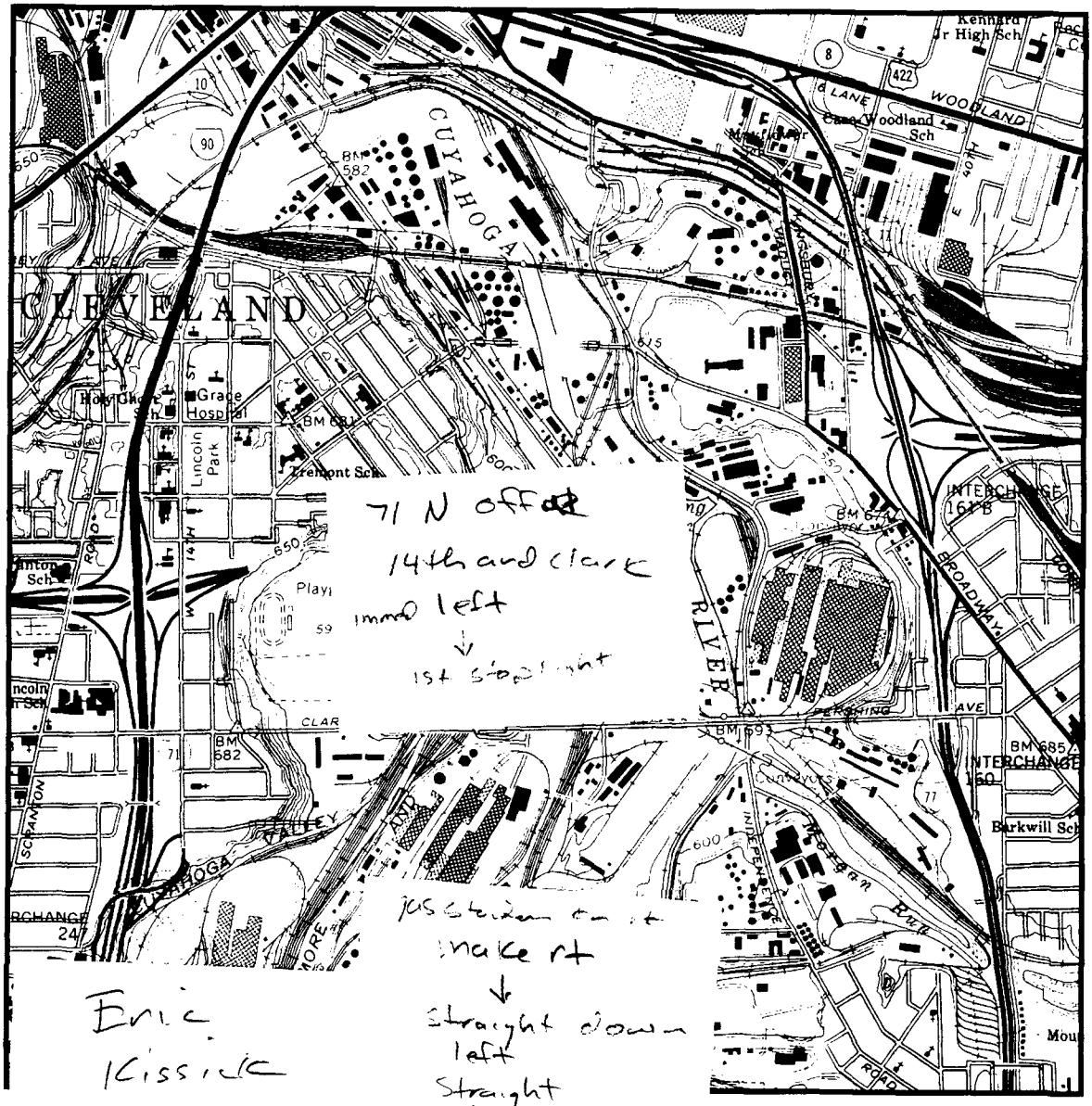
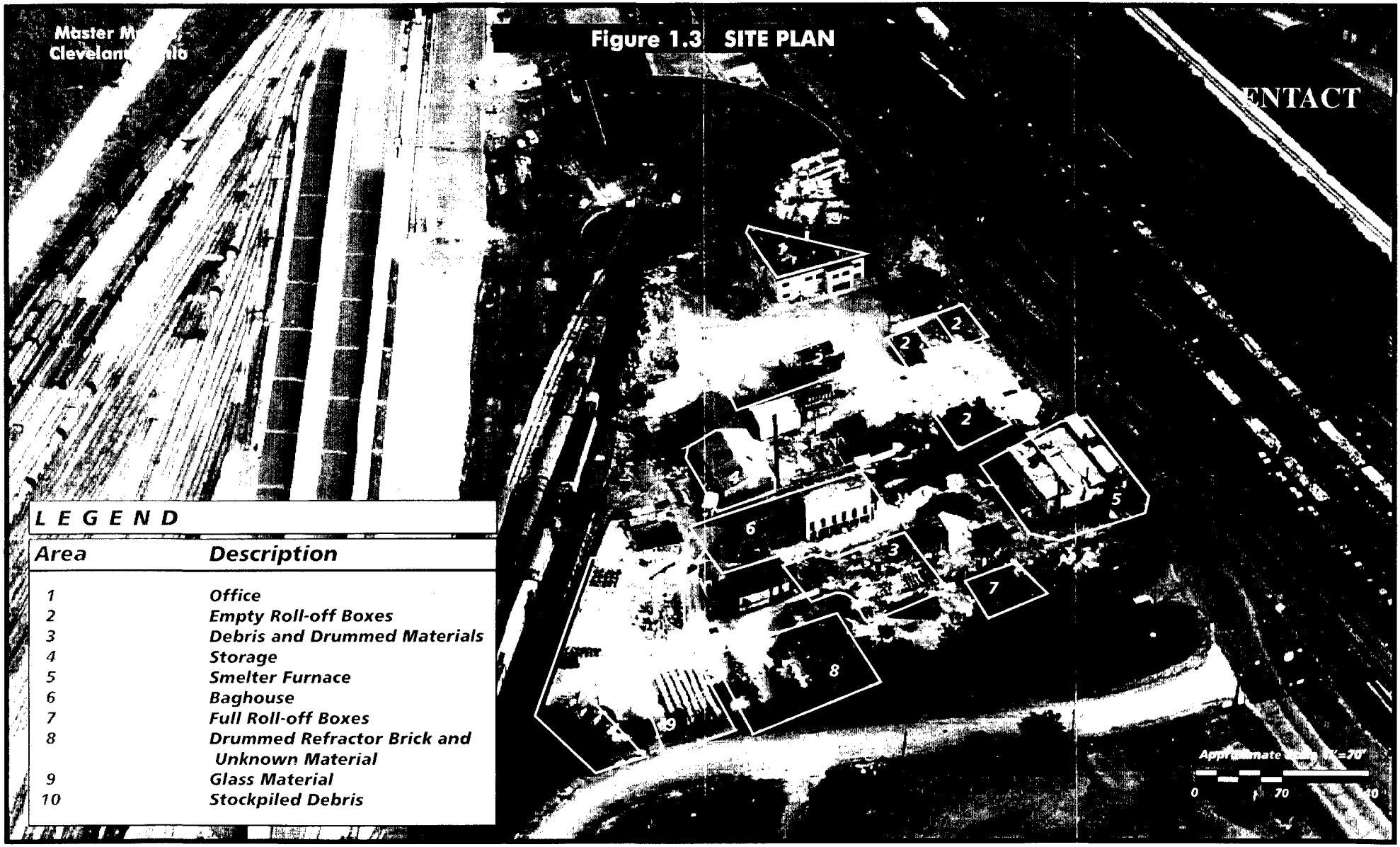


Figure 1.2


Master M
Clevelan
Figure 1.3 SITE PLAN
ENTACT
LEGEND
Area Description
1 Office
2 Empty Roll-off Boxes
3 Debris and Drummed Materials
4 Storage
5 Smelter Furnace
6 Baghouse
7 Full Roll-off Boxes
8 Drummed Refractor Brick and Unknown Material
9 Glass Material
10 Stockpiled Debris
0
70

2.0 MOBILIZATION AND SITE PREPARATION

2.1 Site Health and Safety Plan

Mobilization to the Master Metals Site will begin with the implementation of the Phase I Site Health and Safety Plan (H&SP) which is supplied as Appendix B. This H&SP has been completed by ENTACT as a site specific plan to help guide activities during the removal action occurring at the Master Metals Site.

2.2 Site Security

Site security and access control will be maintained 24 hours a day by a perimeter fence. The majority of the site perimeter is surrounded by a six foot chain link fence with smaller lengths comprised of wooden fence material. This perimeter fence will be maintained, monitored and inspected throughout the removal action.

In the event that sections of fence have to be removed to accommodate excavation or other activities, a temporary fence will be installed. This fence will be maintained until activities in that area are complete, at which time the perimeter fence will be reinstalled. Care will be taken during all removal activities to maintain and ensure the integrity of the perimeter fence to eliminate possible entry by unauthorized individuals.

During mobilization, signs will be placed on the perimeter fence indicating the presence of existing hazards and limiting access to authorized personnel.

2.3 Site Control Measures

Site control measures will consist of stormwater runoff control, emission control, and the establishment of exclusion work zones. Stormwater runoff will be controlled by the use of silt fences and other sediment controlling devices. These devices will be installed in any location surrounding excavation activities where possible stormwater runoff may leave the site. Existing stormwater basins will be temporarily capped during the removal activities to ensure that there will be no contaminant migration offsite.

Dust and fugitive emissions will be controlled and monitored by the use of engineering controls and air monitoring. Engineering controls will consist of water misting in excavation and removal areas and misters installed on treatment equipment. The quantity of water utilized for misting will be sufficient to control dust but not enough to leave residual water accumulation on the ground.

Work zones will be established and enforced during removal activities. The Safe Zone will be designated as the area away from primary contamination and operations. An Exclusion Safety Zone will be established in the area surrounding the actual operations. An approximately fifty foot radius around activities will be included in the Exclusion Safety Zone when heavy equipment or other machinery is being utilized. The reason for increased exclusion in this area is to prevent incidental entry into the path of the equipment.

An Exclusion Zone will also be established around the treatment and processing area. Personnel decontamination zones will be established to facilitate decontamination of personnel after leaving the Exclusion Safety Zone. These areas will be designated by the project manager.

2.4 Office and Decontamination Trailers

An office trailer will be established on site complete with electricity, phone and fax capabilities, and a controlled environment for computer terminals and printers. Restroom facilities will also be maintained in the office trailer.

Adjacent to the office trailer will be a decontamination trailer which will provide the transitional path from the safe zone into the exclusion zone on site. (Figure 2.1) This trailer will house the PPE donning area and decontamination room for ENTACT associates, contractors, and authorized site visitors. This trailer will also provide restroom facilities as well as PPE decontamination facilities.

2.5 Site Preparation

Preparing the site for removal activities will initially consist of clearing general site debris from the safe zone in which the office and decontamination facilities will be located. After this zone has been established, preparation for the removal action will begin and will consist of the following:

- ***clearing and grubbing vegetation,***
- ***removing existing debris,***
- ***surveying, and***
- ***identification of buried utilities.***

Trees and vegetative cover located inside the work zones will be removed and disposed of as necessary. Currently known hazards and utility right-of-ways will also be identified prior to any disturbance of the soils. All equipment operators will be notified prior to any excavation of all possible hazards in regard to utilities (i.e., electric, gas, communications, water, sewer, and cable). All appropriate utility companies will be notified prior to excavation to identify and mark all known utilities. If utilities are identified in areas to be excavated, then the excavation procedures will be coordinated with the utility companies prior to breaking ground. Hand excavation around utilities will be performed as necessary to insure appropriate safety protocol.

At the onset of mobilization, all required permitting issues will be determined and resolved concerning the activities associated with the removal action.

2.6 Personnel and Equipment Estimates

All on-site personnel must be OSHA 29 CFR 1910.129-trained hazardous material technicians.

Equipment to be utilized may consist of excavators, front end loaders, stabilization equipment, cranes, rubber tire backhoes, and engineering controls such as misters for dust suppression and decontamination. Additional equipment will include XRF instruments, sampling equipment, and decontamination equipment.

2.7 Air Monitoring

Air monitoring will be performed on-site to ensure that all personnel and local residents are not exposed to levels of

particulate matter or airborne lead concentrations in excess of the regulated limits, and to ensure that contamination of the surrounding areas is not taking place.

For this project, Clean Air Act monitoring methodologies will be employed to monitor for respirable dust and lead emissions in addition to the OSHA defined air monitoring.

Two types of air samples will be collected at the site, total respirable particulate matter (PM10), and personal low volume air quality samples. PM10 samples will be collected to measure total respirable particulate (aerodynamic diameter less than or equal to 10 μm) in the air (per OAC 3745-17-02). The samples will be analyzed for total mass collected as well as total lead. The air monitoring methodologies described above will dictate engineering

controls to ensure worker safety and that contamination of surrounding residential areas does not occur.

PM10 monitors will be strategically positioned upwind and downwind on the Site and will be operated over 24 hour periods. Local wind data will be reviewed to determine the optimum locations for these monitors.

Air quality samples will be collected to determine the amount of lead particles and respirable dust in the air and will ensure that construction activities are protective for worker safety. Air quality samples will be collected with low volume samplers on personnel and potential generation areas. The low volume samplers will be positioned upon personnel in such a way as to obtain a sample from the breathing zone of the worker. Potential generation areas will consist of the demolition area, excavation area, treatment area and any other contaminated material handling area.

A hand held random air monitor (miniRAM) will be utilized to measure particulate matter continuously throughout the work period each day in and around the work zone. If any average reading for the daily work period exceeds 0.150 mg/m^3, dust suppression measures will be elevated. If miniRAM monitoring indicates elevated levels, removal activities may be suspended while additional dust suppression controls are implemented.

For the project's duration, PM10 and low volume air samples will be sent in for analysis once every five working days. If the RAM unit indicates elevated ambient air particulate matter levels (greater than 0.150 mg/m^3 averaged over an 8 hour work day) on a specific day, the samples taken that day will also be sent in for analysis. Low volume area and personnel monitors will be analyzed for total lead. The remaining samples will be archived for the remainder of the project.

Conditions at the site will be maintained such that the National Primary and Secondary Ambient Air Quality Standards for particulate matter of 150 $\mu g/m^3$ of air (based on a 24-hour average concentration) and 1.5 $\mu g/m^3$ for lead (based on a quarterly average) are not violated at the work zone boundary. Personnel will not be exposed to greater than 50 $\mu g/m^3$ of lead over an 8-hour period in accordance with 29 CFR 1910.1025.

Figure 2.1 PROJECT LOGISTICS MAP


Master Metals,
Cleveland, Ohio
Figure 3.1 SITE COORDINATE GRID SYSTEM
ENTACT
LEGEND
Approximate location of 25' X 25'
Sampling Grid

Table 3-1 List of Phase I Parameters and Test Methods

Test Description	Test Method①	Extraction Method	Matrix	Frequency	Container	Preservative	Sample Size	Maximum Holding Time	Reporting Limit (mg/kg)
Total Lead	XRF ③	NA④	soil	each grid	Field Test	NA	NA	NA	NA
Total Lead	SW-6010	SW-3050	soil	1 per 200 c.y.⑤	P/G ②	None	100 g	6 months	4.0
Total Arsenic	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	10
Total Selenium	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	25
Total Barium	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	1.0
Total Cadmium	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	0.25
Total Chromium	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	0.5
Total Silver	SW-6010	SW-3050	soil	1 per 200 c.y.	P/G	None	100 g	6 months	0.5
Total Mercury	SW-7471	NA	soil	1 per 200 c.y.	P/G	None	100 g	28 days	0.025
TPH ⑥	SW-8015	NA	soil	1 per 200 c.y.	Glass	None	100g	14 days	0.1
Pesticides	SW-8080	NA	soil	1 per 200 c.y.	Glass	None	125 g	⑦	See Table 3-2
Soil pH	SW-9045B	NA	soil	1 per 200 c.y.	P/G	None	100 g	⑧	NA

NOTES:

① Sample Test Method designated as SW-xxxx is from EPA SW-846
② P/G - Plastic or Glass
③ XRF - X-Ray Fluorescence Analyzer
④ NA - Not Applicable
⑤ C.y. = cubic yards
⑥ Total Petroleum Hydrocarbons
⑦ Samples must be extracted within 14 days and extracts analyzed within 40 days following extraction
⑧ Samples should be analyzed as soon as possible upon receipt for pH

Table 3-2 Pesticide Parameters

Test Name	Units	Default Result	Method
Aldrin	mg/kg	<0.005	SW-8080
Chlordane	mg/kg	<0.05	SW-8080
Dieldrin	mg/kg	<0.005	SW-8080
4, 4' - DDD	mg/kg	<0.005	SW-8080
4, 4' - DDE	mg/kg	<0.005	SW-8080
4, 4' - DDT	mg/kg	<0.005	SW-8080
Endosulfan I	mg/kg	<0.005	SW-8080
Endosulfan II	mg/kg	<0.005	SW-8080
Endosulfan Sulfate	mg/kg	<0.005	SW-8080
Endrin	mg/kg	<0.005	SW-8080
Endrin Aldehyde	mg/kg	<0.005	SW-8080
Endrin Ketone	mg/kg	<0.005	SW-8080
Heptachlor	mg/kg	<0.005	SW-8080
Heptachlor Epoxide	mg/kg	<0.005	SW-8080
alpha-BHC	mg/kg	<0.005	SW-8080
beta-BHC	mg/kg	<0.005	SW-8080
gamma-BHC	mg/kg	<0.005	SW-8080
delta-BHC	mg/kg	<0.005	SW-8080
Methoxychlor	mg/kg	<0.05	SW-8080
Toxaphene	mg/kg	<0.2	SW-8080

TABLE 3.3

SUMMARY TABLE OF GRID SAMPLING AND ANALYSIS PROGRAM FOR PHASE I TIME CRITICAL ASSESSMENT MASTER METALS, CLEVELAND, OHIO

Sample Type	Analysis Parameters	Investigative Samples			Field Quality Control Samples									
					Field Duplicates[2]			Field Blanks			MS/MSD[1]			
		No.[4]	Freq.	Total	No.	Freq.	Total	No.	Freq.	Total	No.	Freq.	Total	Total
Extent of Contamination Investigation	Field - - XRF Survey	34	1	34	--	--	--	--	--	--	--	--	--	34
	Laboratory ---- Lead	9	1	9	--	--	--	1	1	1	--	--	--	10
Excavation Verification	Field - - XRF Survey	34	1	34	--	--	--	--	--	--	--	--	--	34
	Laboratory ---- Lead	9	1	9	--	--	--	1	1	1	--	--	--	10
	Laboratory ---Cadmium, Arsenic	3	1	3	--	--	--	1	--	1	--	--	--	4
Backfill Testing	Laboratory --- RCRA Metals[3]	1	1	1	--	--	--	--	--	--	--	--	--	1
	Laboratory --- Soil pH	1	1	1	--	--	--	--	--	--	--	--	--	1
	Laboratory --- TPH	1	1	1	--	--	--	--	--	--	--	--	--	1
	Laboratory --- Pesticides	1	1	1	--	--	--	--	--	--	--	--	--	1

[1]For lead analysis, no extra sample volume is required; MS/MSD will be performed at a rate of one per twenty investigative samples analyzed by the laboratory.
[2]For XRF analysis, triplicate XRF measurements will be taken at each interval during extent of contamination and final excavation verification only.
[3]RCRA Metals = arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury.
[4]Excavation and backfill numbers are based on an estimate of 2,500 cubic yards of material to be removed and one sample to be collected for every source.

3.0 SAMPLING AND ANALYSIS PLAN

3.1 Statement of Objectives

This Sampling and Analysis Plan for Phase I time-critical removal actions will be implemented at the Master Metals Site for the following types of samples:

- Solid Media and Soil Samples;
- Liquid Media Samples;
- Treated Material Samples;
- Backfill Samples;
- Decontamination Rinse Water Samples; and
- Air Quality Samples.

The objectives of these sampling activities include:

- Field profile extent of contamination in the gravel/soil covered areas;
- Assist in field excavation and removal tasks;
- Direct removal action tasks;
- Verify that assessment criteria have been achieved;
- Classify untreated and treated soils/solid media for disposal;
- Profile liquid media for disposal/recycling;
- Characterize backfill material; and
- Verify control of air emissions during removal action tasks.

Lead is the predominant contaminant at the MMI Site and is the selected indicator analyte based on previous investigation, specifically the 1992 site assessment and hazard evaluation conducted by Ecology & Environment, Inc., Technical Assistance Team (TAT). For the purpose of the extent of contamination (EOC) within the soil/gravel covered areas at the MMI Site, technicians will excavate materials to a maximum depth of two (2) feet or until fill materials are encountered. This will be accomplished by using a combination of XRF measurements and laboratory analyses.

Based on previous investigation data (i.e., "Subsurface Investigation Report", prepared by Compliance Technologies, Inc. in 1991), the majority of the MMI site was built upon slag fill materials historically generated from steel industries in the area. In the event that fill materials (i.e., slag, cinders, etc.) are encountered, excavation of materials will cease and XRF EOC samples will be collected.

3.2 Sampling Activities Implementation Schedule

Sampling activities will commence during the site preparation activities described in Section 2.0 and will continue throughout the project as described in the following sections.

3.3 Sample Identification System

A sample identification system will be implemented to properly track sampling activities. The sampling activities and examples of the identification coding system associated with each type are listed below with a following explanation:

Solid Media and Soil Sampling	
X-Ray Fluorescence Extent of Contamination	**X-04-3**
Analytical Extent of Contamination	**E-07-3**
Analytical Verification	**V-07-3**
Containerized Material-Solid	**CMS-000**
Containerized Material-Liquid	**CML-000**
Non-Treated Material- Classification (TCLP)	**US-000**
Treated Material-Confirmation (TCLP)	**TS-000**
Wastewater	**WW-000**
Backfill Material	**BF-000**
Air Sampling	
PM10 Samples	**HV-000**
Personal/Area Air Monitoring	**AS-000**
Quality Control Samples	
Field Rinsate Blanks	**FB-000**

All numbering sequences shown above with "000" will begin with the number "001" and will continue upward by one unit (i.e., FB-001, FB-002, FB-003, etc.) until the final samples for the removal action are collected.

X-Ray Fluorescence (XRF) extent of contamination (EOC) samples will be numbered for incorporation into the XRF log-in database. The samples will be numbered with the grid identification number and the depth from ground surface. The grid numbering system is explained in Section 3.4. For example, an XRF sample obtained from an excavation in Grid 7, from 1 feet below ground surface, will be designated X-07-1.

The EOC samples to be sent to the laboratory will be obtained as a single grab sample from within a grid. Single samples will be numbered with the unique grid identification number, and sampling depth from ground surface. For example, an EOC laboratory sample obtained from the excavation in Grid 7, at 1 foot below ground surface, will be designated E-07-1

Verification samples to be sent to the laboratory will be labeled similar to the EOC nomenclature. For example, a verification sample obtained from the excavation in Grid 7 from 1 feet below ground surface, will be designated V-07-1.

3.4 Establishment of Coordinate Grid System

A coordinate grid system (CGS) will be established in the soil/gravel covered areas on-site (i.e., the southeast corner and along the rail spur on the west side of the site) in order to provide a coordinate system for tracking sampling and excavation activity in the field. The CGS will consist of square grids of 25 feet by 25 feet superimposed over the soil/gravel covered areas (Figure 3.1). This coordinate system will be used to 1) locate sample locations, and 2) provide reference markers for excavation activities at the site.

3.5 Sampling Procedures

3.5.1 Extent of Contamination and Verification Sampling

The purpose of the extent of contamination (EOC) sampling is to determine the vertical and horizontal extent of soils and other solid media within the soil/gravel covered areas which contain total lead concentrations. Technicians will excavate materials to a maximum depth of two (2) feet or until fill materials are encountered. EOC sampling will be accomplished by using a combination of XRF measurements and laboratory analyses.

Based on previous investigation data, the MMI site was built upon slag fill materials historically generated from

steel industries in the area. In the event that fill materials (i.e., slag, cinders, etc.) are encountered, excavation of materials will cease and XRF EOC samples will be collected.

The following procedures describe the overall sampling process during the EOC and verification sampling in the soil/gravel covered areas. Specific XRF and soil sampling procedures are described in subsequent sections.

1. The sampling team will adhere to health and safety protocols defined in the Health and Safety Plan.

2. EOC sampling will be initiated within the established coordinate grid system in the soil/gravel covered areas. Sampling will progress

in an orderly fashion by moving laterally to each grid.

3. A visual reconnaissance of a grid will be made and observations recorded pertaining to the surface presence of obvious battery casing debris, and other surface cover material potentially impacted by lead.

4. The XRF will be used to obtain at least three measurements per each grid. The XRF sampling procedures are presented later in this section.

5. If XRF readings reveal lead impacted materials then excavation of the grid will continue to a maximum depth of two (2) feet. In the event that fill materials (i.e., slag, cinders, etc.) are encountered, excavation will cease.

6. XRF readings will be collected from the center of the grid. A minimum of three XRF readings will be collected per grid prior to discontinuing excavation. The excavated soil will be removed to the staging area as described in Section 4.0.

7. A verification grab sample will then be obtained from each grid that does not exhibit the presence of fill materials (i.e., slag, cinders, etc.) at frequency of not less than 20%. Verification samples will be submitted to the laboratory for analysis to confirm XRF data. In addition, the three (3) XRF samples exhibiting the highest lead concentrations will also be laboratory analyzed for total arsenic and cadmium.

8. The above procedures are to be repeated for each numbered grid to a maximum depth of two (2) feet or until fill materials (i.e., slag, cinders, etc.) are encountered.

EOC samples for laboratory analyses will be collected during the early stages of excavation to develop a site-specific correlation between XRF total lead and TCLP lead concentrations. These samples will be single grab samples obtained at the same locations as the XRF EOC measurements. The laboratory analysis will be used to further calibrate the XRF for site-specific conditions. An explanation of the soil sampling procedures is presented later in this section.

3.5.2 XRF Sampling Procedures

XRF analysis for total lead on soil and solid media will be performed as follows:

a.Sampling teams will adhere to health and safety protocols defined in the Health and Safety Plan.

b.The sample locations will be identified through establishment of the coordinate grid system and XRF. measurements will be taken on the ground surface or upon the excavation sidewall.

c.For ground surface samples, an approximate 6 inch by 6 inch square area will be cleared of vegetation and debris, with care being taken to remove as little surficial soil as possible, to provide a flat area for XRF analysis.

d.For excavation samples the XRF will be placed directly in contact with the area to be scanned to obtain the necessary total lead data.


ENTACT sampling activities


XRF sampling activities

e.The XRF probe will be placed on the flat, compacted soil surface, activated and held in place for the 60- second scanning period.

f.The sample identification number will be entered into the unit's computer memory and saved along with the result. This data is downloaded into the master database at the end of each day.

3.5.3 Soil and Solid Media Sampling Procedures for Laboratory Analysis

Soil and solid media sampling for samples to be submitted for laboratory analysis will be performed as follows:

a.The sampling team will adhere to health and safety protocols defined in the Health and Safety Plan.

b.Designated sampling locations will be identified. Photographs will be maintained to document sample locations.

c.Staging areas for sample collection will be established. Polyethylene sheeting will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:

- Field Logbook;
- Plastic or glass laboratory-supplied sample containers;
- Stainless steel or plastic disposable trowels;
- Stainless steel or plastic bowls;
- Measuring tape;
- Distilled water and gloves; and
- Five (5) gallon buckets for decontamination liquids

d.A sufficient amount of soil will be retrieved by sample trowel or (hand auger for containerized solids) and placed into clean sample containers. The soil samples will be grab samples whereas the containerized solids will be composited based on the contents of the container.

e.Field notes will be completed and will include identification of the soil being sampled, soil color, condition and other pertinent information.

f.Chain-of-custody documents will be prepared. Sample containers will be labeled in accordance with the predetermined sample numbering system, sealed in a plastic bag and shipped to the laboratory for analysis.

g.All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

Tables 3-1, 3-2 and 3-3, which are located at the end of this section, contain a listing of EOC and verification samples to be taken, analyses, test methods to be utilized, matrix being sampled, frequency of sampling, notes regarding handling and/or sample containers and amount of sample material to be collected.

3.5.4 Liquid Media Sampling Procedures for Laboratory Analysis

There are approximately fifty drums of containerized liquids located inside the roundhouse building and the storage building. These drums will be profiled for hazardous waste characteristics for removal and appropriate disposal. Additionally, the ASTs will be assessed to determine if any product is present, and if so, samples will be collected for profiling.

Liquid media sampling for containerized liquids to be submitted for laboratory analysis will be performed as follows:

a.The sampling team will adhere to health and safety protocols defined in the Health and Safety Plan.

b.Designated sampling locations will be identified. Photographs will be maintained to document sample locations.

c.Staging areas for sample collection will be established. Polyethylene sheeting will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:

- *Field Logbook;*
- *Plastic or glass laboratory-supplied sample containers;*
- *Combined liquid waste sampler (COLIWASA);*
- *Measuring tape;*
- *Distilled water and gloves; and*
- *Five (5) gallon buckets for decontamination liquids*

d.The container will be opened and sampled with a COLIWASA such that the entire depth of the liquid material is traversed. The composited volume of liquid will be placed into clean sample containers.

e.Field notes will be completed and will include identification of the liquid being sampled, color, condition of the container and other pertinent information.

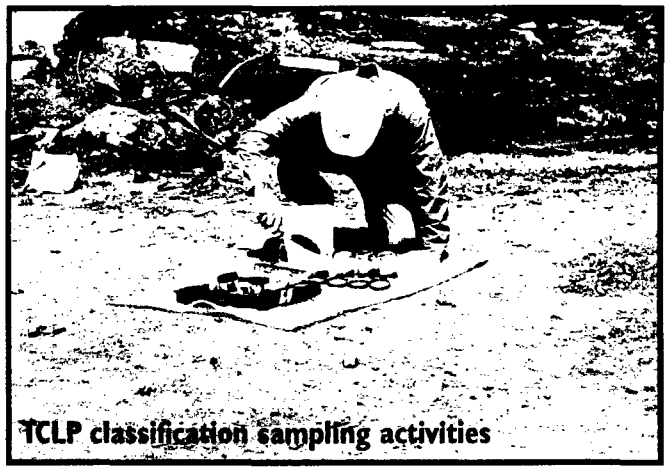
f.Chain-of-custody documents will be prepared. Sample containers will be labeled in accordance with the predetermined sample numbering system, sealed in a plastic bag (or metal can depending on the nature of the material) and shipped to the laboratory for analysis.

g.All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

3.6 TCLP Classification Sampling

Excavated materials will be segregated immediately after excavation into two piles, those expected to exhibit a lead Toxicity Characteristic Leachate Procedure test result (TCLP) of less than 5 mg/l and those expected to exhibit a lead TCLP of 5 mg/l or greater. This initial segregation will be accomplished by using an XRF total lead vs. TCLP lead correlation. The correlation will be developed through sample results from the initial stages of the project.

The material which indicates total lead concentrations in excess of the correlation will be segregated and stockpiled for classification sampling. The frequency of classification sampling will be one (1) grab sample from every 200


TCLP classification sampling activities

cubic yards of material. If results from a sample indicate TCLP lead at or above 5 mg/l, the batch will be moved to the treatment staging area for stabilization.

The laboratory parameters for material classification sampling are total lead and TCLP lead. Analytical parameter methods are listed on Tables 3-1 and 3-2.

The following field methods will be utilized for these sampling efforts:

a.The sampling team will adhere to health and safety protocols defined in the Health and Safety Plan.

b.Staging areas for sample collection will be established. Polyethylene sheeting will be placed adjacent to the areas to be sampled during sample collection.

c.A sufficient amount of material will be retrieved by sample trowel and placed into a clean, stainless steel or plastic bowl and homogenized. The sample will then be inserted into the sample container.

d.Field notes will be completed and will include identification and location of the batch being sampled and other pertinent information.

e.Chain-of-custody documents will be prepared, sample containers will be labeled in accordance with the predetermined identification system and samples will then be sealed in plastic bags and shipped to laboratory for analysis.

f.All sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

g.All treated material will be staged in a tank, container, and/or building until verification indicates materials as non-hazardous.

3.7 Treatment Confirmation Samples

As previously discussed, an XRF total lead versus TCLP lead correlation factor will be established and utilized to segregate excavated materials. Excavated materials, which exhibit a total lead concentration equal to or greater than the correlation factor based on XRF, will be taken directly to the treatment staging area. These materials will be treated as described in Section 4.0. Following treatment, the material will be sampled and analyzed for TCLP lead, arsenic, and cadmium. The frequency of sampling will be one grab sample from every 200 cubic yards of treated material. If a sample indicates that treatment to less than 5 mg/l TCLP lead and arsenic and 1 mg/l TCLP cadmium was not accomplished, the entire batch will be retreated. A list of analytical methods is presented on Tables 3-1 and 3-2.


Treatment confirmation sampling

In addition to the potential treatment of the excavated materials, various containerized solids located on site may require treatment. Based upon review of available data and profiling data, the containerized solids exhibiting hazardous characteristics for metals will be segregated in the treatment staging area. The containerized solids will be treated as described in Section 4.0. Following treatment, the materials will be sampled and analyzed via TCLP for appropriate metals. A list of analytical methods is presented on Tables 3-1 and 3-2.

The following field methods will be utilized for these sampling efforts:

a.The sampling team will adhere to health and safety protocols defined in the Health and Safety Plan.

b.Staging areas for sample collection will be established. Polyethylene sheeting will be placed adjacent to the areas to be sampled during sample collection.

c.A sufficient amount of material will be retrieved by a sample trowel and placed into a clean, stainless steel or plastic bowl and homogenized. The sample will then be inserted into the sample containers.

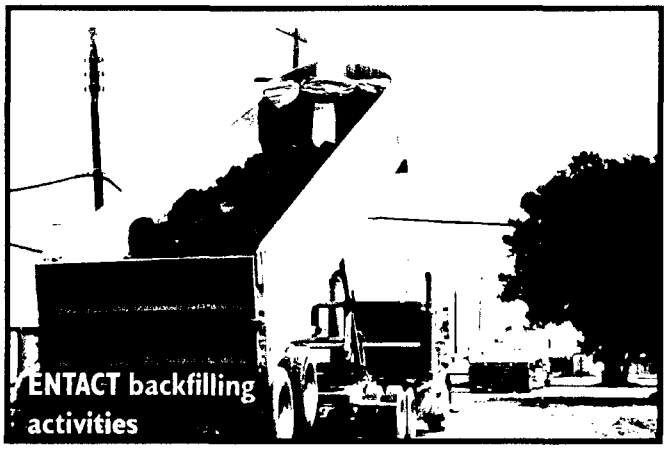
d.Field notes will be completed and will include identification and storage location of the batch being sampled, sample number, data and other pertinent information.

e.Chain-of-custody documents will be prepared, sample containers will be labeled in accordance with the predetermined identification system and samples will be sealed and shipped to the laboratory for analysis.

f.All sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

3.8 Backfill Material

Following excavation in the soil/gravel covered grid areas and completion of verification analysis, if applicable, designated areas will be backfilled utilizing clean native soils. A list of analytical methods is presented in Tables 3-1 and 3-2.



An outside backfill source will be required during site restoration activities on the MMI Site. The following steps will be performed:

1. The backfill source location will be visited and inspected to ensure the source area can supply the type of clean backfill soil and volumes required. Directly involved governmental agencies will be notified in writing of the location from which backfill soils will be obtained and site visits may be conducted by those agencies and split samples may be collected.

2. Grab samples will be obtained directly from a clean backfill source location. Each sample will be located within the areas that, as indicated by the backfill source operator, will supply the backfill soil for the Phase I time-critical removal actions. Samples will be collected from various depths during the sampling activity. The samples will be obtained as follows:

a. No PPE is deemed necessary for this sampling task except for the wearing of disposable, latex gloves.

b. A sufficient amount of soil will be retrieved from a discrete sample location by sample trowel and placed into a clean, stainless steel and briefly homogenized. The sample will then be inserted into the sample containers.

c. Samples to be analyzed for TPH and Pesticides are to be filled to the top of the jar and packed in with no substantial air voids and no headspace.

d. Field notes will be completed and will include a description of the soil being sampled, soil color, condition, photographs of each sample location and other pertinent information.

e. Chain-of-custody documents will be prepared, sample containers will be labeled in accordance with the predetermined identification system and samples will be sealed then placed in plastic bags and placed on ice for shipment to the laboratory for analysis.

f. All sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

Each off-site backfill soil sample will be analyzed for total metals: arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury, soil pH, total petroleum hydrocarbons, and pesticides. A list of analytical parameters is shown in Tables 3-1 and 3-2.

Metal concentration ranges for the above parameters will not exceed the contaminant levels that currently exist on site based on either data derived from these Phase I activities or previous studies. A certification will be prepared to show that the soil supplied for the project came from the borrow source which was sampled.

3.9 Air Sampling Procedures

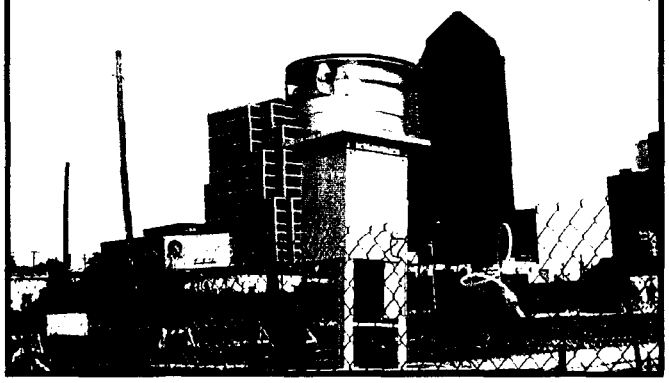
The national primary and secondary ambient air quality standard for particulate matter is 150 micrograms per cubic meter of air based on a 24 hour average concentration. The same standards for lead are 1.5 micrograms per cubic meter of air for a calender quarter average (per EPA Region V Air and Radiation Division Issue Paper June 30, 1992 regarding "Ambient Lead Monitor Readings at Master Metals, Inc., Cleveland, Ohio"). These established action levels will utilized at the Master Metals Site during all removal activities. Engineering controls will be utilized to minimize the possibility of particulate lead contaminants becoming airborne. These controls will consist of perimeter, area and instantaneous field monitoring, as well as continuous misting during excavation, loading and handling of contaminated material. Personnel will be

sampled on a rotational basis.

3.9.1 Perimeter Monitoring

To ensure that engineering controls are effective, ambient air monitoring will be sampled from four (4) perimeter locations inside property boundaries including the existing air monitor currently located on the northeast corner of the property. Representative samples of ambient air conditions will be collected by using PM10 samplers (per OEPA Chapter 3745-17-02 of the Administrative Code).

Perimeter air monitoring will be conducted



Sample locations will be established both upwind and downwind of site activities and can be found in Figure 2.1. These four locations will allow for accurate collection of data from property boundaries.

The PM10 samplers that will be used on site are Graseby GMW, General Metal Models 321-B/MFC HVPM10 sampler. These units control the mass of air flowing through the units as opposed to some other units that use a volume control scheme. Mass flow controllers provide more stable and accurate flow rates. Perimeter samples will be taken on a daily basis with the PM10 monitors. One day out of the work week the perimeter sample filters will be sent to the lab on a standard weekly basis and analyzed for total lead (40 CFR 50 Appendix G) and particulate matter. Samples will also be sent for analysis if instantaneous monitors (miniRAM) indicate possible problems on a given day. Laboratory instrument quantitation limit to be used for ambient air sample analysis should not exceed the National Ambient Air Quality Standard (NAAQS) for lead of 1.5 micrograms per cubic meter of air.

All readings will be recorded by ENTACT's Quality Assurance/Quality Control Technician and will be utilized to assess the effectiveness of engineering controls. Areas which indicate ambient air lead concentrations above a target level of 1.0 micrograms per cubic meter of air will be noted and additional engineering controls will be administered to ensure that levels do not exceed the NAAQ standard of 1.5 micrograms per cubic meter of air. In the event that PM10 results for particulate matter exceed 150 micrograms per cubic meter of air, additional misting procedures will be implemented to further control emissions and additional monitoring devices will be utilized if necessary.

3.9.2 Area Monitoring

Ambient air monitoring will also be conducted at areas of possible emissions (e.g. excavation areas, material loading/transporting, demolition etc.). MiniRAMs will be utilized periodically on a daily basis in the immediate area surrounding removal activities to instantaneously monitor fugitive dust emissions. The instantaneous monitor allows for immediate response if fugitive dust conditions approach the action level of 20% opacity as a three minute average (per OEPA Chapter 3745-17-07 of the Administrative Code). The action level of 0.15 milligrams per cubic meter of air will be established as a conservative level to alter or increase engineering controls to alleviate the fugitive dust emission occurrence. Upon reaching this level operations will cease until engineering control can be increased in that area. High Time Weighted Average (TWA) levels from instantaneous monitoring will also trigger samples from perimeter and personnel sampling for analysis.

3.10 Data Quality Objectives

3.10.1 Data Quality Needs

A combination of two levels of data quality objectives will be utilized in this project to address field screening and laboratory analytical data. Data Quality Objective Level 2, Field screening methods (XRF) will be used during the field assessment and excavation. Data Quality Objective Level 4 samples will also be analyzed in the laboratory for confirmation of treatment, waste classification for proper disposal, and air monitoring. Samples will be analyzed for the parameters listed on Tables 3-1 and 3-

2. Rinsate blanks will be taken for field quality assurance (QA) and quality control (QC), as well as laboratory QA and QC to be performed for all samples submitted to the laboratory. A complete description of all QA and QC procedures is presented in the Phase I Quality Assurance Project Plan (QAPP), presented in Appendix B of this Work Plan.

3.10.2 Detection Limit Requirements

The level of concern for each parameter directly affects the data quality requirements. Therefore, the sampling and analysis methods must be accurate at the level of concern. Furthermore, it is necessary that the analytical technique chosen has a detection limit well below the level of concern.

Analytical methods that can accurately quantify constituents below their levels of concern will be used for the Master Metals sample analyses. The detection limits will generally be much less than the levels of concern. It is necessary that data quality objectives be consistent with assessment levels or other levels. Therefore, analytical detection limits should be less than the level of concern for each constituent and will be selected so that any analyzed parameter result can be compared to the appropriate level.

The QAPP discusses the planned detection limits for analyses along with the methods to be used for this investigation in order to address the various levels for comparison.

3.10.3 Chain-of-Custody Procedures

Proper documentation of sample collection and the methods used to control these documents are referred to as Chain-of-Custody (COC) procedures. COC procedures are essential for presentation of sample analytical results as evidence in litigation or at administrative hearings conducted by regulatory agencies. COC procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples. The QAPP describes all COC procedures for both field use and laboratory use. An example COC record form is also presented in the QAPP.

3.11 Sample Shipping

For shipping, all samples will be stored on ice and packaged in such a manner as to prevent damage or breakage during shipment or transport. Samples not delivered to the laboratory will be shipped through an overnight parcel service by sampling personnel. Samples will be placed into suitable containers, labeled and sealed in such a manner that tampering with the seal would be obvious. All sample holding times will be tracked and a copy of the Chain-of-Custody form will accompany the samples in a sealed plastic bag. Sample shipping is discussed in the QAPP.

3.12 Field Instrument Operation and Calibration

X-Ray Fluorescence Analyzer

The Spectrace 9000 energy dispersive X-Ray Fluorescence analyzer will be the instrument utilized for Removal Action tasks. The Spectrace 9000 utilizes three radioisotope sources. Each source emits a different energy (wavelength) of radiation which provides efficient analysis of specific ranges of elements. An 60-second scan time will be utilized for the duration of the Removal Action. Only qualified analysts trained in the proper use, theory, and safety of XRF analysis will operate this system.

The principle of XRF analysis is based on electron excitation. Elemental atoms in a soil sample are irradiated with a beam of X-Rays. Electrons in the atoms at lower lying


XRF standardization activities

energy levels are excited to higher energy levels. The vacancies left in the inner electron orbitals make the atom unstable. Relaxation to the ground state occurs, resulting in the emission of X-Rays characteristic of the excited elements. Thus, by examining the energies of the X-Rays emitted by the irradiated soil sample, identification of elements present in the sample is possible. Comparing the intensities of the X-Rays emitted from a given sample to those emitted from reference standards with known analyte concentrations allows quantification of the elements present in the samples.

Prior to any on-site activities, the Spectrace 9000 will be properly calibrated in order to allow for accurate sample analysis. During on-site activities, the XRF will be standardized daily utilizing referenced standards for quality assurance and quality control.

PM10 Air Monitoring Equipment

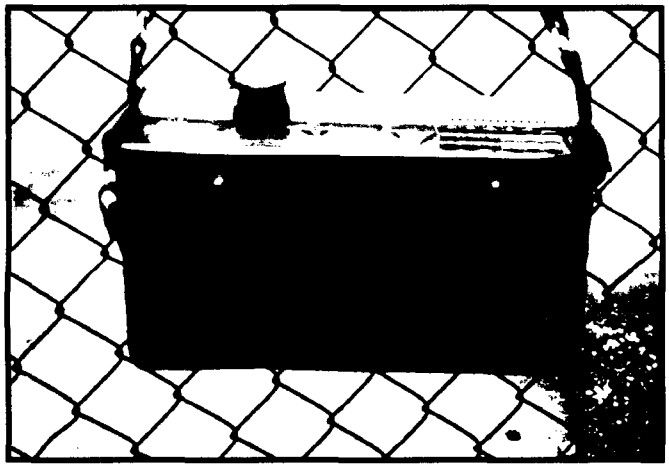
PM10 samples will be collected from an Anderson General Metal Works PM10 sampler, model 321-B/MFC HVPM10. The units will be calibrated weekly in accordance with the manufacturers recommendations. Assembly, operation, and calibration procedures can be found in "Instruction and Operation Manual High Volume PM10 Sampler".

Personal/Area Air Monitors

An air sampling pump kit utilizing a Escort Passport Personnel Sampling Pump and preloaded filter cassettes will be used for personal and area air monitoring. These units will be calibrated before each use and adjusted, as necessary, in accordance with manufacturer's instructions.

Random Air Monitors

PDM-3 MiniRAM Dust Monitors manufactured by Measurement Systems, Inc., will be used for random air monitoring. This unit measures respirable dust concentrations from 0.01 to 100 mg/m^3. Concentration data is displayed on a LCD readout and stored in the instruments memory.



Random Air Monitors will be utilized

4.0 REMOVAL ACTIVITIES

The following section describes the various tasks that will be performed as part of Phase I removal activities at the Master Metals Site.

4.1 Mapping of On-site Materials

Upon arrival at the site, analysis and mapping of waste materials and contamination will commence to assist in removal activities. Site reconnaissance will be completed for the purpose of identifying the locations of all waste materials and on site areas of concern.

4.2 Treatability Study for Stabilization

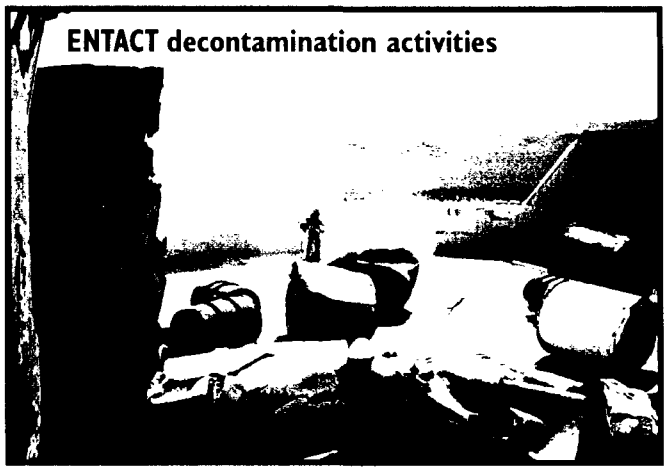
A treatability study will be conducted to determine the most efficient and effective blend of additive to effectively reduce lead, cadmium, arsenic and other potential inorganic contaminant's leachability in the treated material to non-hazardous levels (TCLP). During the treatability study, each sample will also be analyzed for total RCRA metals.

Lead has been identified as the main contaminant of concern. However, past investigations at the site revealed elevated levels of arsenic and cadmium. Barium, chromium, and nickel have also been detected at the site. Treatability samples will be collected from on-site materials known to contain high levels of heavy metal contamination. One quart sample jars will be used to collect grab samples of surface and subsurface material. XRF field screening will be used to verify that the samples contain high levels of total metals. Samples will be delivered to an accredited laboratory, individually homogenized, and analyzed for selected total and TCLP metals.

Portions of the individual samples will be mixed/treated with varying ratios of additives that are proven effective for heavy metal impacted materials. The stabilized samples will then be analyzed for the appropriate TCLP metals. The results will be evaluated to determine the appropriate and economic add-mixture ratio which yields TCLP values below hazardous leachable levels.

4.3 Decontamination Activities

Several buildings, structures, tanks, containers, roll-off boxes, and barrels will require decontamination prior to off site disposal or recycling.



Prior to initiation of decontamination procedures, areas will be prepared for operations. Polyethylene sheeting or other effective wind barriers will be strategically positioned to prevent material from migrating during activities.

Equipment located in and around the buildings will be decontaminated by utilizing air powered chisels, high pressure hydroblasters and assorted decontamination tools. Residual that is removed will be placed in roll-off boxes and properly secured for later disposal or recycling.

Evacuation routes and decontamination units for personnel and equipment will be placed to facilitate efficient operations. Air monitoring pumps will be calibrated and positioned to obtain necessary air data for worker exposure monitoring. Temporary lighting systems will be implemented, if necessary, to illuminate the work area.

During decontamination activities, crews will remove any additional small debris left after heavy equipment has been utilized to remove the large stockpiles of debris. Following this activity, surface areas will be high pressure hydro decontaminated using 2,500 psi water blasters.

The resulting water will be contained and transferred to the on-site holding tank and utilized in the treatment process or for dust suppression of heavy metal impacted materials awaiting treatment and/or disposal.

Decontamination-Areas of Interest

Baghouse Facility

The baghouse structures and internal components will be decontaminated after lead dust material has been removed from the floor and walls of the baghouse facility.

Preparation of the baghouse structure, prior to decontamination activities, will include sealing structure openings as applicable to eliminate dust emissions.

The bags will be removed and carefully placed in containers free of hooks and cages. Following removal of the bags, the baghouse will be hydro decontaminated. Resulting decontamination water will be collected and containerized for future disposal.

Furnace Room

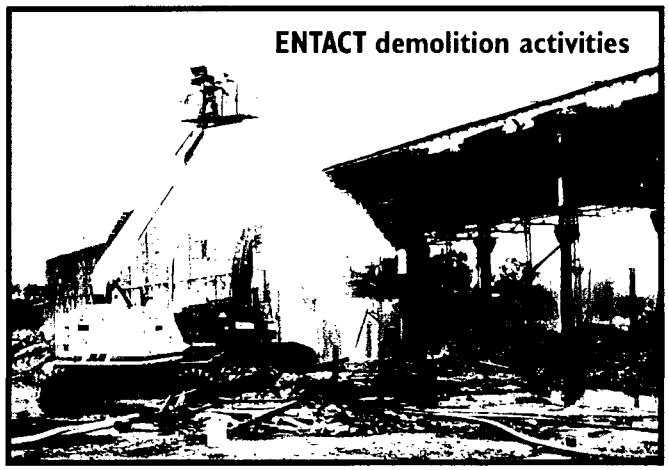
The furnace room is currently open on the north, south and west side. Several furnace, kettles and tanks are located inside and around the furnace room building. Decontamination procedures of the various vessels will include removal of residual material, surface decontamination with high pressure hydroblasters and hand chisels , and final rinsing prior to off-site recycling or disposal.

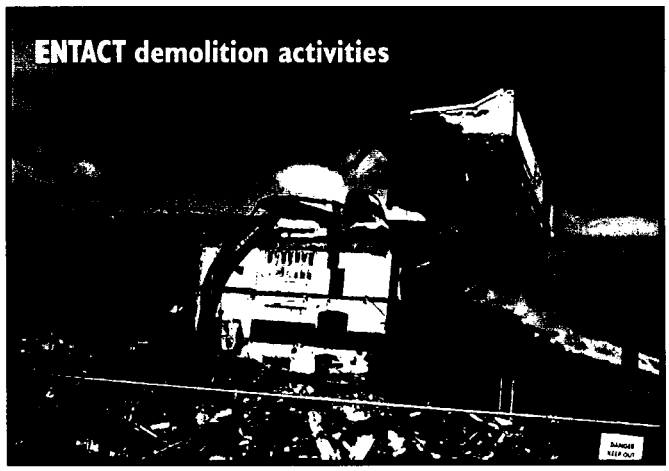
All residual materials will be properly secured in roll-off boxed and/or drums for later disposal.

Once the vessels have been decontaminated and removed, the building structures will be decontaminated. All decontamination waters will be collected and utilized during the stabilization process. Evaporation techniques will also be implemented when appropriate.

4.4 Demolition Activities

All demolition activities begin with well organized strategies. Plans are devised in order to maximize crew member and site personnel safety, work space, and efficiency. They include proper area preparation, proper equipment,


ENTACT demolition activities


ENTACT demolition activities

geographically smart staging areas to maximize work space for stockpiling, loading, and transporting of all debris, and segregation and sizing of all materials for off-site disposal. Additionally, areas that may be suspect to have asbestos containing material (ACM) will be assessed prior to demolition in order to re-strategize the demolition plan, if necessary.

Area preparation will include warning all site personnel in the work zone of any areas that will be undergoing demolition for that day. Crew members not needed for a particular piece of demolition will be assigned to tasks away from heavy demolition areas. Caution tape will be placed around areas under demolition. Any utilities that are obstructions or possible hazards will be identified and brought to the attention of equipment operators and work zone personnel.

Water misting procedures will be implemented during demolition activities to control emissions. Additionally, air monitoring controls will be implemented to ensure minimal particulate releases.

Resulting demolition debris will be segregated and handled appropriately for recycling or disposal. Scrap metal will be segregated for reclamation purposes.

All demolition services will be performed in accordance with applicable federal, state, and local requirements.

Demolition Areas Requiring Special Attention

Two areas require special attention during demolition activities: the brick baghouse building and the furnace structure. Due to a combination of severe deterioration and extensive gross contamination, special attention is required in retiring these structures.

Brick Baghouse Building

The demolition of the baghouse structure will entail three operations:

1. ***Removal of stack***
2. ***Removal of piping located on roof of structure and around lower sides***
3. ***Demolition of building***

The removal of the smoke stack from the baghouse structure will be the first operation towards the demolition of this facility. The stack is currently being supported via its original attachment at its base and two cable wires attached to the stack itself and anchored at ground level. However, four cable wires originally held it straight and upright. Since only two cables remain today, it is assumed that the stack is in a potentially precarious state. Thus, in order to maximize safety to ENTACT crew members and surrounding personnel, the stack will be retired first.

Successfully bringing the stack to the ground will require mobilization of a crane to the site. The base of the stack will be anchored to a piece of heavy machinery using high ton cable. This will keep the base or tail end in place to prevent it from swinging and to allow the crane the ability to lay the stack on its side. The stack will then be secured to the crane with all current support apparatus still in place (i.e. attachments at base and wire cables). Once the crane has secured the stack and can support its weight by itself, the remaining support apparatus will be cut utilizing an oxygen/acetylene cutting torch. Once cut free, the crane will lift the stack and lay it on its side. During this procedure, misting operations will be occurring to minimize any dust emissions.

Once the stack is removed, efforts will shift towards the removal of piping on the roof of the structure. Utilizing the same crane, it will attach itself to sections of piping using high ton straps. Once the crane supports each portion and assumes its weight, the bolts holding the sections together will be cut with an oxygen/acetylene torch. Once cut free, each section of piping will be suspended in mid-air. Each end will then be quickly wrapped with plastic and taped securely. This will hold any potential contaminants inside of the pipe. The pipe sections will then be lowered to the ground and staged in a designated area for decontamination.

To remove the section of piping around the lower level of the building, the same method will be utilized. However, because the level of the piping is much lower, an on-site excavator will be used to removed the pipe sections instead of the crane.

Once all exterior piping has been removed, focus will then shift upon the demolition of the brick building. The roof will first be assessed prior to demolition as to whether it contains asbestos. Depending on the outcome, demolition strategies may need to be changed. An excavator will be used to tear the building down. Misting controls will be deployed simultaneously during the entire demolition of this structure.

Demolition of the Furnace Structure

Due to the considerable dilapidation of this structure and haphazard salvaging efforts, the structural soundness of this building has been severely jeopardized. Necessary assessments must be made upon arrival on-site and prior to any demolition campaign of this area. These on-site assessments are:

- ***Structural soundness of remaining building portions***

- ***Roofing Composite***

- ***Extent of Gross Contamination***

The structural integrity of the furnace building is a crucial item relating to its demolition. Potentially serious safety hazards appear abundant in this building and cannot be accurately assessed until ENTACT Project Management is on-site. Additionally, the structure's roofing may have asbestos containing material and the extent of gross contamination can both have the potential to alter demolition plans.

Upon determination that the structure is safe to enter and work in, current plans for the demolition of the furnace building call for an immediate collection of gross contamination on the ground. Once the area in and around the building is cleared of gross contamination, efforts will focus on the tanks, kettles, and deteriorated metal baghouses. Any openings in the tanks or kettles will be closed using plastic, plywood, or other applicable means to securely hold contamination inside. Once secured, an excavator will be used to bring these units down on their side. Once on their side, they will then be decontaminated and cut in manageable pieces utilizing an oxygen/acetylene torch. The same method will be applied to the metal baghouses upon assessment of their condition.

The building will then be demolished using an excavator. It will be approached from its west side and torn in the direction away from the adjacent street. Misting operations will be heavily deployed during the demolition of this structure.

4.5 Aboveground Storage Tanks

The aboveground storage tanks (ASTs) located in the northeast corner of the Site will be assessed to determine whether any products are present. If products are present, profile samples may be collected to evaluate disposal alternatives for the liquids. Once the liquids have been removed, the AST will be decontaminated and removed from the secondary containment structure.

Following removal of the ASTs, the secondary containment structure will be decontaminated to remove any residual petroleum hydrocarbons. Decontamination rinsates from the AST area will be segregated from other decontamination rinsates for characterization. Based on the characterization data, disposal alternatives will be evaluated.

4.6 Excavation Activities

Excavation of areas not covered by permanent structures (i.e., cement slabs) will begin along the west side of the site nearest the railroad spur. The railway spur will be removed to facilitate efficient and effective removal of lead contaminated materials. Utilizing an XRF analyzer for guidance, technicians will begin to excavate to a maximum depth of two (2) feet or until fill material is encountered.

The XRF analyzer will be properly calibrated with site specific and manufacturers standards on a daily basis. QA/QC samples will be collected at the frequencies and by the procedures specified in the Quality Assurance Project Plan, Appendix C of this Work Plan.

Once all affected materials are removed from a grid area, final excavation verification samples will be collected and submitted to the laboratory as detailed in Section 3.

It is anticipated that some portions of the perimeter fence may need to be removed to facilitate the removal action. In this case temporary fence will be erected and the perimeter fence will be reinstalled following the comple-

tion of all removal activities.

Following excavation, contaminated materials will be segregated and transferred to the treatment area for staging, treatment (if required) and sampling. Prior to treatment, the XRF analyzer will be utilized to segregate excavated material into treatment and non-treatment stockpiles. This segregation will be based on a pre-determined correlation between XRF total lead and TCLP lead. Utilizing this correlation, excavated materials will be segregated based on the need for treatment (i.e. whether they leach TCLP lead concentrations less than or greater than 5.0 mg/l or TCLP of other metals of concern).

Materials that are not conducive to treatment such as metal debris, large concrete debris, tires, and wood timbers will be segregated, sampled, decontaminated and properly disposed.

4.7 Engineering Controls

During removal activities, extensive dust suppression measures will be implemented. Wetting and dust suppression measures will be implemented during activities that may generate dust emissions. Wetting will be performed in a manner so as not to saturate the soils or cause runoff control issues.

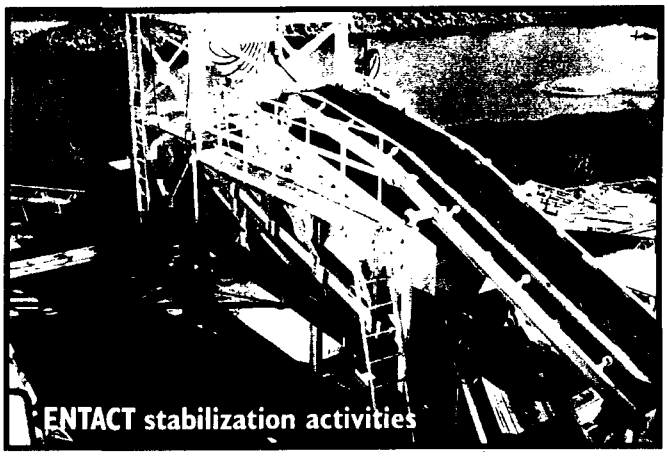
A designated person in each Exclusion Zone will be responsible for eliminating all visible emissions. This person has the authority to stop all removal and transporting activities, as necessary, to enforce this requirement. Broad span water misting will be used to suppress possible dust emissions from open areas. Air monitoring will also be performed as outlined in Section 2 and 3.

4.8 Stabilization Operations

The material requiring treatment will be treated through a chemical fixation/stabilization process.
The treatment approach presented herein has been used successfully at other sites with heavy metal contaminated soil, debris, refractory brick, slag, and residual material.

The ENTACT patented treatment process combines heavy metal contaminated material with a chemical additive to reduce leachable metal concentrations to non-hazardous levels. The process maximizes particle surface area and thoroughly mixes waste with additive to create a more thoroughly treated product than conventional soil treatment units. The chemical additive is also an ENTACT patented product.

The waste preparation portion of the treatment unit consists of a series of specially designed crushing units and screens to reduce particle diameters. As a result, the particle surface area available to react with the treatment additive is maximized. The unit has the ability to recycle the waste material through the sizing units to consistently deliver the desired particle size. This type of quality control on the particle size is unique to the ENTACT system. Once particle sizing has been achieved, the stabilization additive (a dry material) is metered into the waste stream based on the weight of waste material flowing through the treatment system. The waste and stabilization treatment additive is then mixed in the mixing chamber to form a granular homogeneous product suitable for handling and non-hazardous disposal.



The chemistry of stabilization relies on soil moisture to create the stabilization reaction (i.e. solution chemistry).

The treatment additive reacts with the heavy metal to create compounds with the metal ions which are stable and insoluble, and thus are prevented from dissolving, leaching and migrating. ENTACT's patented treatment additive uses a combination of the following chemicals to facilitate this stabilization:

phosphoric acid,

monocalcium phosphate,

monoammonium phosphate and

diammonium phosphate

The above additives provide the two necessary components necessary to stabilize the metal ions, the phosphate ion and the phosphoric acid buffer system. For the Master Metals material, lead, cadmium and arsenic are the main contaminants of concern. However, additional metals may be present in the feed stock remaining on-site. In order for chemical fixation/stabilization to be successful, the various forms of metals need to be converted to compounds that are particularly insoluble under the normal pH range.

ENTACT's patented treatment system and additive are proven technology. The process and additives provide the necessary environment including particle size, phosphate ion, buffering system, and thorough mixing needed to successfully treat heavy metal contaminated material.

Following final non-hazardous verification, materials will be disposed of in accordance with OEPA's Special Waste regulations.

5.0 SITE RESTORATION

Site restoration at the culmination of Phase I activities will include the following:

backfill of the excavated areas;
compaction, grading and revegetation; and
scarification or sealing of remaining cement foundations

5.1 Backfill and Site Grading in Excavated Areas

Following excavation, segregation, and treatment activities open excavations will be backfilled with a native fill material.

Compaction of the backfill material will be performed based on a standard proctor density. Backfill will be placed and compacted in 12 inch lifts to 85% of standard proctor density.

Following removal of structures and debris, the remaining cement foundation will be decontaminated and scarified or sealed.

5.2 Final Site Grading and Revegetation

Once the site has been returned to original elevations, final grading will be performed to develop adequate drainage patterns. Once final grading has been completed, the restored areas not covered by cement will be hydro-seeded. Excavated areas will be returned to their previous state (i.e., areas with vegetation will be seeded and areas with stone will be replaced with stone). Also, to facilitate erosion control, the silt fences established during site preparation procedures will remain until an acceptable stand of grass is established. Photos will be taken after project completion to document that the excavation site has been restored to its original condition.

Site restoration activities

6.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

ENTACT has responsibility to satisfactorily complete Phase I Removal Action at the Master Metals Site. ENTACT will perform the work described in the Phase I Work plan and prepare status reports during the course of the Removal Action. The various quality assurance, field, laboratory, and management responsibilities of key personnel are defined below.

6.1 Project Organization Chart

The lines of authority for this specific project are depicted on Figure 6-1. This chart includes the individuals discussed below.

6.2 Management Responsibilities

6.2.1 U.S. EPA Remedial Project Manager

The U.S. EPA Remedial Project Manager (RPM), Mr. Thomas Alcamo, has overall responsibility for all phases of the removal action. Mr. Alcamo can be contacted as follows:

Mr. Thomas Alcamo
Remedial Project Manager
U.S. EPA - Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604-3590
(312) 886-7278

6.2.2 Project Coordinator

Dean C. Pisani will be the Project Coordinator for the Master Metals Site. He can be contacted at the following address and phone number:

Mr. Dean C. Pisani
ENTACT & Associates
1360 N. Wood Dale Drive Suite A
Wood Dale, Illinois 60191
(630) 616-2100
Digital Pager (800) 910-9157

Section 6.2.3 Contractor's Project Management Team

The individuals that will serve as the project management team are:

Project Management:
Robert Santoro/Erich Kissick

Field Project Management:
Stacy Sain/Mike Stoub

Quality Assurance Officer:
Shane Banks, Engineer

Technical/Regulatory Support:
Mike DeRosa, Chemist/Regulatory Specialist (not on site)

6.3 Laboratory Responsibilities

National Environmental Testing (NET) of Chicago, Illinois will be utilized for all analyses. NET is an accredited laboratory with locations nationwide that can assist in emergency situations. Mary Pearson will be the laboratory project manager for the Master Metals Site.

Master Metals
Cleveland, Ohio

PHASE I
PROJECT ORGANIZATIONAL CHART

ENTACT
May 9, 1997

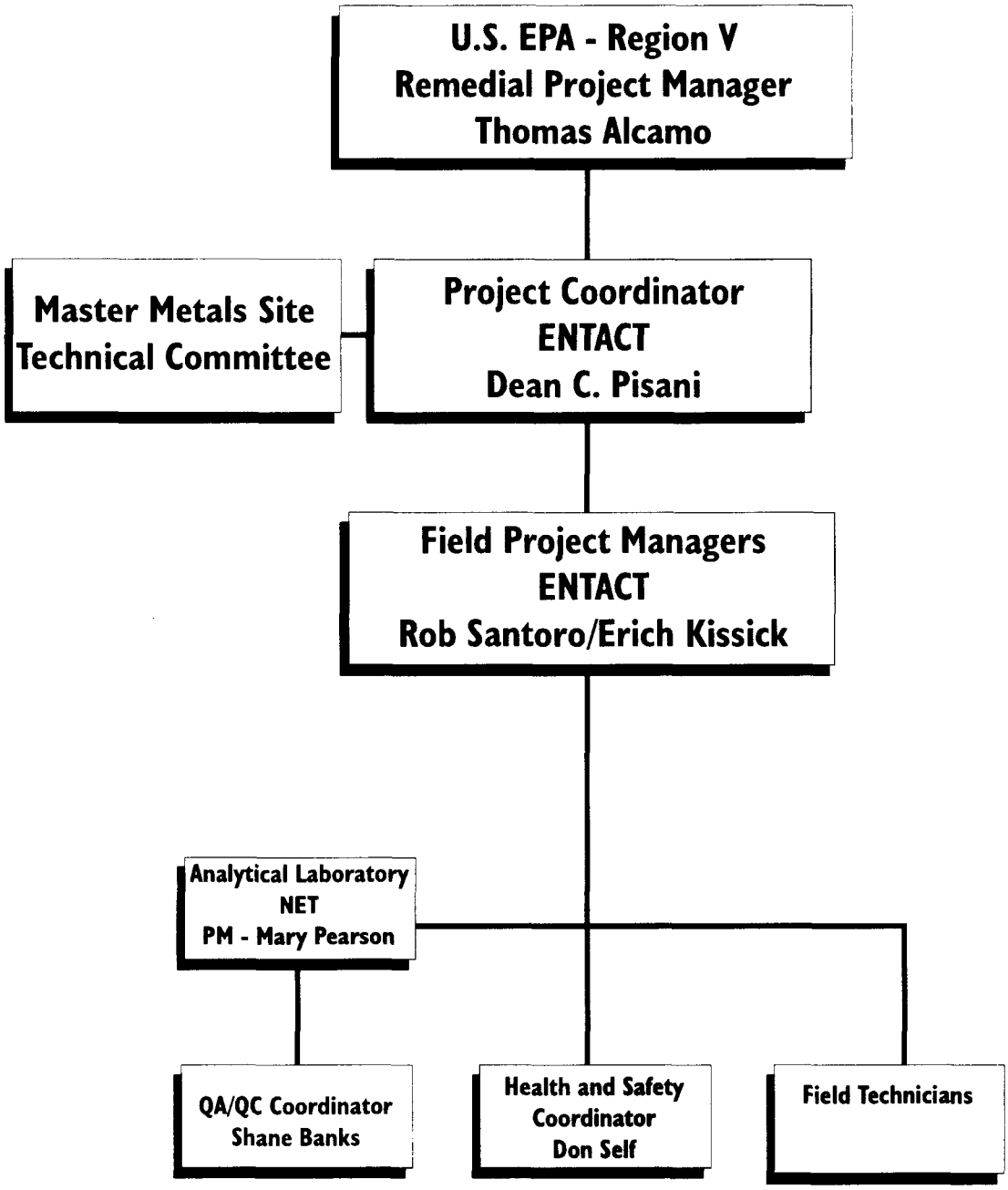


FIGURE 6-I

7.0 STATUS REPORTING AND FINAL REPORT

7.1 Reporting Requirements

Information generated during the course of this project will be reported to EPA in the form of monthly Status Reports and a Final Report at the end of the project. The frequency and content of these reports is detailed below.

7.2 Status Reports

During the course of Phase I activities, status reports will be submitted to the EPA on a monthly basis. The Status Reports will include the following information:

Project Status,

Significant developments for the reporting,

Work performed during the reporting period,

Problems encountered,

Resolution of problems,

Data collected, and

Anticipated progress and development for upcoming period.

7.3 Final Report

Within 60 calender days after completion of all removal actions defined within this Work plan, a final report summarizing the actions taken to comply with the Order will be submitted to EPA for review. The report will include but is not necessarily limited to the following items:

Summary of actions taken to comply with the Order,

Excavation verification analytical results,

Treatment analytical results,

Backfill analytical results,

Air monitoring analytical results,

Photographic documentation of project activities, and

Trueness, accuracy, and completeness certification.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF:	)	Docket No. V-W-97-C-402
	)	
Master Metals, Inc.	)	ADMINISTRATIVE ORDER BY
Site, Cleveland, Ohio	)	CONSENT PURSUANT TO
	)	SECTION 106 OF THE
	)	COMPREHENSIVE
	)	ENVIRONMENTAL RESPONSE,
Respondents:	)	COMPENSATION, AND
	)	LIABILITY ACT OF 1980,
Listed in Attachment A	)	as amended, 42 U.S.C.
	)	§ 9606(a)
	)	

I. JURISDICTION AND GENERAL PROVISIONS

This Order is entered voluntarily by the United States Environmental Protection Agency ("U.S. EPA") and the Respondents. The Order is issued pursuant to the authority vested in the President of the United States by sections 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9606(a), 9607 and 9622. This authority has been delegated to the Administrator of the U.S. EPA by Executive Order No. 12580, January 23, 1987, 52 Fed. Reg. 2923, and further delegated to the Regional Administrators by U.S. EPA Delegation Nos. 14-14-A, 14-14-C and 14-14-D, and to the Director, Superfund Division, Region 5, by Regional Delegation Nos. 14-14-A, 14-14-C and 14-14-D.

This Order requires the Respondents to perform removal actions and to reimburse response costs incurred by the United States in connection with property located at the Master Metals, Inc. (MMI) facility, 2850 W. Third Street, Cleveland, Ohio (the "Facility"). Not addressed by this Order is residential property located at and around 1157, 1159 and 1167 Holmden Avenue, Cleveland, Ohio (the "Holmden Properties"). The Facility and Holmden Properties will be referred to collectively herein as the "Master Metals Site" or the "Site".

This Order requires the Respondents to conduct a two-phased response action at the Master Metals Facility. This Order requires

the Respondents in Phase I to conduct time-critical removal actions pursuant to the National Contingency Plan ("NCP"), 40 C.F.R. Part 300, as amended, and the Superfund Accelerated Cleanup Model ("SACM") guidance, to abate an imminent and substantial endangerment to the public health, welfare or the environment that may be presented by the actual or threatened release of hazardous substances at or from the Master Metals Facility. The specific elements of Phase I are set forth in more detail herein. This Order requires the Respondents in Phase II to conduct an Engineering Evaluation and Cost Analysis ("EE/CA") Report of alternative response actions pursuant to 40 C.F.R. § 300.415(b)(4)(i), and the SACM guidance, to address the environmental concerns in connection with the Master Metals Facility.

A copy of this Order will also be provided to the State of Ohio, which has been notified of the issuance of this Order pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

Respondents' agreement to perform or actual performance under this Order shall constitute neither an admission of liability, nor an admission of U.S. EPA's findings or determinations contained in this Order, except in a proceeding to enforce the terms of this Order. Respondents agree to comply with and be bound by the terms of this Order. Respondents further agree that they will not contest the basis or validity of this Order or its terms in any action by the United States.

II. PARTIES BOUND

This Order applies to and is binding upon U.S. EPA, and upon Respondents and Respondents' heirs, receivers, trustees, successors and assigns. Any change in ownership or corporate status of any Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter such Respondent's responsibilities under this Order. Respondents are jointly and severally liable for carrying out all activities required by this Order. Compliance or noncompliance by one or more Respondents with any provision of this Order shall not excuse or justify noncompliance by any other Respondent.

Respondents shall ensure that their contractors, subcontractors,

and representatives comply with this Order. Respondents shall be responsible for any noncompliance with this Order.

III. FINDINGS OF FACT

Based on available information, including the Administrative Record in this matter, U.S. EPA hereby finds, and, for purposes of enforceability of this Order, the Respondents stipulate that the factual statutory prerequisites under CERCLA necessary for issuance of this Order only have been met. U.S. EPA's findings and this stipulation include the following:

1. The Master Metals Site is comprised of both the MMI Facility and a nearby residential property area, the Holmden Properties, where MMI lead-bearing materials were deposited as fill.

2. The MMI Facility is located in the "flats" area of downtown Cleveland, in an industrialized sector of the City. This property encompasses 4.3 acres. It is bordered on two sides by railroad tracks, with an LTV Steel facility located immediately to the east and south. The Cuyahoga River is located approximately 1,500 feet to the east. A playground and athletic field is located approximately 1,500 feet to the west and the nearest residential area begins approximately 2,000 feet to the northwest.

3. Persons, including but not limited to the Respondents listed in Attachment A, arranged for disposal or treatment or arranged with a transporter for transport for disposal or treatment of hazardous substances at the MMI Site or accepted hazardous substances for transport to disposal at the MMI Site.

4. The current property owner of the Facility is MMI. The President of MMI is Douglas K. Mickey.

5. National Lead Industries, Inc. (NL) initially constructed the Facility in 1932, building it on slag fill. It owned and operated the Facility as a secondary lead smelter, producing lead alloys from lead-bearing dross and lead scrap materials. NL also engaged in battery cracking as part of its operations.

6. MMI purchased the Facility in 1979. MMI thereafter continued to run the Facility as a secondary lead smelter, receiving lead-bearing materials from off-Site sources. The lead-bearing feed material received by MMI was classified and regulated under the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. §§ 6901 et seq., as "D008" hazardous waste. In its operations, MMI used rotary and pot furnaces to convert these lead-bearing materials into lead ingots. Each furnace utilized by MMI contained a baghouse, a pollution screening structure that collected particulate matter from the furnace. The collected dust comprised approximately 60 percent lead. The sludge remaining in the furnaces after smelting was classified and regulated under RCRA as "K069" hazardous waste.

7. By-products from the smelting operation included furnace flux, slag, dross, baghouse fines and furnace sludge. Excluding slag, most of the material was recycled back into the furnaces. Slag was tested and disposed of off-Site. Cooling water was diverted to the City of Cleveland sewer system. Finished lead ingots were stored in the roundhouse at the north end of the property prior to shipment off-Site.

8. MMI had a long history of non-compliance with various state and federal environmental, health and safety laws, as well as a history of poor operating practices; releases of hazardous materials to the environment, including the Facility property, have been documented.

9. On November 19, 1980, MMI filed a "Part A permit" pursuant to RCRA, thereby obtaining "interim status" under RCRA to operate certain of the Facility's waste piles and treatment units, as well as a container-based storage area.

10. MMI filed for Chapter 11 bankruptcy on January 11, 1982, in the United States Bankruptcy Court for the Northern District of Ohio. It subsequently went into reorganization. Prior to November 8, 1985, MMI submitted a Part B RCRA application. However, on November 8, 1985, the hazardous waste piles at the Facility that contained lead-bearing dusts lost interim status for failure to comply with financial requirements of 40 CFR Part 265, Subpart H.

11. The United States filed a complaint for violations of RCRA on June 15, 1987, in the United States Bankruptcy Court for the Northern District of Ohio, seeking closure of the D008/K069 waste piles and compliance with RCRA financial responsibility requirements. On September 4, 1987, MMI and the United States entered a Stipulation to resolve these RCRA violations.

12. In August 1987, MMI submitted a partial closure plan to the United States that included procedures to close the D008 and K069 waste piles. MMI was to submit an additional closure plan to address all other solid waste management units at a later date. As part of the partial closure plan, MMI took subsurface soil samples from the battery storage area waste pile. The soil in this area did contain cadmium and lead, but was not considered toxic according to the U.S. EPA's Environmental Profile ("EP") toxicity criteria. Groundwater was encountered between three and ten feet below ground surface and was found to contain concentrations of lead.

13. On January 15, 1990, MMI entered into a Consent Decree with the United States to resolve continuing RCRA violations. This Consent Decree required, among other things, that MMI properly track all hazardous waste at the Facility; submit annual reports to Ohio EPA; cease battery cracking at the Facility; conduct an investigation to determine subsurface and groundwater conditions at the facility; characterize waste at the Facility; store waste properly; close waste piles containing hazardous waste in accordance with an approved RCRA closure plan; establish closure trust funds or other authorized mechanisms and fund those mechanisms in compliance with RCRA requirements; and establish RCRA-required financial liability coverage.

14. Between January 15, 1990 and August 17, 1990, MMI accumulated over 1,500 alleged violations of the Consent Decree, spanning 19 decree provisions. MMI also committed additional RCRA permit violations during this period, and continued to demonstrate noncompliance with other health and safety standards. Among the incidentals of these violations were MMI's poor handling and control of toxic waste, such that toxic waste remained exposed to the environment at the Facility.

15. In April 1990, MMI submitted to U.S. EPA a revised RCRA "Part B permit" application for closure of various solid waste management units.

16. In August 1990, the United States filed a motion for civil contempt in the District Court for the Northern District of Ohio regarding MMI's Consent Decree violations. The Court denied that motion, granting MMI six months to achieve compliance. The motion for contempt was refiled in January 1991 with the same result. In May 1991, the Court granted the motion, requiring MMI to cease operations in July 1991. However, the Court reconsidered this motion in June and denied the plantiff government's relief.

17. In addition, on November 9, 1990, the United States demanded by letter from MMI $2,286,500 in stipulated penalties for MMI's Consent Decree violations from January 15, 1990 to August 17, 1990, according to the Decree's terms. On June 26, 1992, the United States reached its final determination on these stipulated penalties for MMI, reducing MMI's stipulated penalty to $1,593,000. MMI appealed this determination pursuant to the Decree's provision on dispute resolution to the District Court for the Northern District of Ohio, which never ruled on the penalties. The United States filed a motion to dismiss in October 1996 on the grounds of mootness, which the Court granted in an October 29, 1996 Order.

18. In December 1990, MMI contracted with Compliance Technologies, a consulting firm, to install and sample groundwater monitoring wells on the Master Metals Site. Analytical results from the four monitoring wells indicated that the surrounding groundwater was contaminated at levels greater than the maximum contaminant levels ("MCL") for lead and cadmium established under the Safe Drinking Water Act, 42 U.S.C. § 300f et seq.

19. Analysis of Facility soil samples for total metals and pH by a U.S. EPA-approved laboratory revealed that the Facility soil contained elevated levels of barium, cadmium, chromium, lead and nickel. The southern portion of the Facility near the drum storage area contained concentrations of lead exceeding 10,000 parts per million. Elevated lead levels were also discovered near the battery cracking area.

20. In August 1991, Ohio EPA collected samples of raw materials from the MMI rotary furnace and two waste bins as part of the Consent Decree requirements. These samples contained lead concentrations as high as 5349 mg/l.

21. In July 1992, U.S. EPA contracted with an outside technical assistance team ("TAT") to collect soil samples on and around the Facility property to determine if the Facility contaminants were subject to airborne transport. Analysis of these samples for RCRA metals and Toxicity Characteristic Leachate Procedure ("TCLP") metals by a U.S. EPA-approved laboratory revealed that TCLP lead was present in concentrations more than 200 times greater than the RCRA regulatory level of 5 mg/l, at all sample location points except for one Facility and one off-Facility location. Facility soil samples indicated the presence of TCLP arsenic and cadmium, with one location testing at 115,000 ppm for lead. Surface samples collected from off-Facility near both the Valleyview Apartments complex -- 1,500 feet northwest of the Facility -- and Tremont Valley Park -- 2,000 feet northwest of the Facility -- were found to contain lead concentrations ranging from 148 to 1,850 ppm. The source of this latter lead contamination has not been conclusively traced to MMI.

22. Three ambient air monitors were installed by the Ohio EPA near the facility property in January of 1992. During the first two quarters of 1992, air samples collected from the station immediately downwind of MMI revealed exceedances of the Clean Air Act's ("CAA"), 42 U.S.C. §§ 7401 et seq., National Ambient Air Quality Standards ("NAAQS") for lead. In April and May 1992, four more NAAQS violations were recorded. In July 1992, MMI installed a sprinkler system in an attempt to prevent airborne lead from migrating off the Facility property.

23. On August 3, 1992, Ohio EPA ordered an immediate 30-day shut down of the Facility because of MMI's "life-threatening" violations of the NAAQS for lead. During MMI's shutdown, downwind ambient air monitoring data collected by Ohio EPA registered lead levels in violation of the NAAQS for lead on every day except one. An unknown portion of these NAAQS violations were due to lead-laden Facility dust migrating off-Facility via prevailing winds. To minimize the effects of

wind-blown Facility dust, MMI on September 9, 1992 directed a thorough cleaning of West Third Street.

24. On August 5, 1993, the Ohio EPA director ordered MMI to cease operating the Facility until it could demonstrate compliance. Despite the shutdown of the Facility's furnaces on this date, a U.S. EPA downwind air monitoring station routinely detected elevated lead concentrations as much as 500 times greater than the upwind concentrations and 33 times the NAAQS quarterly average. An unknown portion of these NAAQS violations were due to lead-laden Facility dust migrating off-Facility via prevailing winds.

25. Shortly after MMI was shut down, Bank One of Akron, Ohio took possession of all of MMI's cash collateral and accounts receivable.

26. After MMI's shutdown, MMI and U.S. EPA continued negotiations to resolve MMI's RCRA noncompliance. As part of these negotiations, MMI and Mr. Mickey provided financial information to U.S. EPA.

27. On March 28, 1995, U.S. EPA's RCRA Division deferred the Master Metals Site to CERCLA for cleanup. In an August 22, 1995 letter, MMI withdrew all permits still in effect regarding its operation, effectively terminating its ability to legally treat, store or dispose of hazardous waste at the Facility.

28. Throughout 1995 and 1996, vandals and scavengers visited the Facility on an intermittent basis. Further, in 1995 or 1996, MMI partially demolished one of the Facility structures, leaving piles of rubble, girders and sheet metal standing around the structure's remains.

IV. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above, and the Administrative Record supporting these removal actions, U.S. EPA has determined that:

1. The Master Metals Site is a "facility" as defined by Section

101(9) of CERCLA, 42 U.S.C. § 9601(9).

2. Lead, cadmium, chromium, barium and nickel are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

3. Each Respondent is a "person" as defined by Section 101(21)of CERCLA, 42 U.S.C. § 9601(21).

4. Certain Respondents are the present "owners" and "operators" of the Master Metals Site, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20). All Respondents are either persons who at the time of disposal of any hazardous substances owned or operated the Master Metals Site, or who arranged for disposal or treatment or transport for disposal or treatment of hazardous substances at the Master Metals Site. Each Respondent therefore is liable under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

5. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility and Site into the "environment" as defined by Sections 101(8) and (22) of CERCLA, 42 U.S.C. §§ 9601(8) and (22).

6. The conditions present at the Site constitute a threat to public health, welfare, or the environment based upon the factors set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, as amended ("NCP"), 40 C.F.R. § 300.415(b)(2). These factors include, but are not limited to, the following:

   a. actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants; this factor is present at the Site due to the existence of unprocessed lead-bearing waste material in open containers and in open piles at the Site. This material is also scattered loosely about the Site on the ground. This factor is also present at the Site due to the existence of excessive lead levels detected in Site soils. Air monitoring stations near the Facility have shown elevated lead air levels greater than the NAAQS for lead.

b. hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release; this factor is present at the Site due to the existence of unprocessed lead-bearing waste material in open containers at the Facility.

c. high levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate; this factor is present at the Site due to the existence of lead at levels as high as 115,000 ppm within the soil at and near the Site.

d. weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released; this factor is present at the Site due to the existence of lead bearing waste stored on-Site in an uncontrolled and exposed manner as well as the existence of lead-bearing dust on-Site. Air monitoring stations near the Facility have shown lead levels above the NAAQS for lead.

e. Other situations or factors that may pose threats to public health or welfare or the environment; this factor is present at the Site due to the existence of several unstable, partially demolished buildings, a result of the partial demolition of several former MMI Facility buildings by MMI. The resulting conditions have created the potential for further lead-bearing wastes to escape into the atmosphere. Due to the overall disrepair of the Facility, the former MMI Facility is also a safety hazard.

7. The actual or threatened release of hazardous substances from the Site may present an imminent and substantial endangerment to the public health, welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

8. The removal actions required by this Order, if properly performed under the terms of this Order, are consistent with the NCP. The removal actions required by this Order are necessary to protect the public health, welfare, or the environment.

V. ORDER

Based upon the foregoing Findings of Fact, Conclusions of Law and Determinations, it is hereby ordered and agreed that Respondents shall comply with the following provisions, including but not limited to all documents attached to or incorporated into this Order, and perform the following actions:

1. Designation of Contractor, Project Coordinator, and Remedial Project Manager

Respondents shall perform the removal actions required by this Order themselves or retain contractors to implement the removal actions. Respondents shall notify U.S. EPA of Respondents' qualifications or the name and qualifications of such contractors, whichever is applicable, within 5 business days of the effective date of this Order. Respondents shall also notify U.S. EPA of the names and qualifications of any other contractors or subcontractors retained to perform work under this Order at least five business days prior to commencement of such work. U.S. EPA retains the right to disapprove of any of the contractors and/or subcontractors retained by the Respondents. If U.S. EPA disapproves a selected contractor, Respondents shall retain a different contractor within two business days following U.S. EPA's disapproval and shall notify U.S. EPA of that contractor's name and qualifications within three business days of U.S. EPA's disapproval.

Within 10 business days after the effective date of this Order, the Respondents shall designate a Project Coordinator who shall be responsible for administration of all the Respondents' actions required by the Order. Respondents shall submit the designated coordinator's name, address, telephone number, and qualifications to U.S. EPA. To the greatest extent possible, the Project Coordinator shall be present on-Site or readily available during Site work. U.S. EPA retains the right to disapprove of any Project Coordinator named by the Respondents. If U.S. EPA disapproves a selected Project Coordinator, Respondents shall retain a different Project Coordinator within 10 business days following U.S. EPA's disapproval and shall notify U.S. EPA of that person's name and qualifications within 11 business days of U.S. EPA's disapproval. Receipt by Respondents' Project Coordinator of any notice or communication from U.S. EPA relating to this Order shall constitute receipt by (all) Respondents.

The U.S. EPA has designated Thomas Alcamo, Remedial Response Branch, Region 5, as its Remedial Project Manager (RPM). Respondents shall direct all submissions required by this Order to the RPM at 77 West Jackson Boulevard, Mail Code SR-6J, Chicago, Illinois, 60604-3590, by certified or express mail. Respondents shall also send a copy of all submissions to Kris Vezner, Assistant Regional Counsel, 77 West Jackson Boulevard, Mail Code C-29A, Chicago, Illinois, 60604-3590, and to Bart Ray, Ohio Environmental Protection Agency, Northeast District Office-DERR, 2110 E. Aurora Rd., Twinsburg, OH, 44087. All Respondents are encouraged to make their submissions to U.S. EPA on recycled paper (which includes significant postconsumer waste paper content where possible) using two-sided copies.

U.S. EPA and Respondents shall have the right, subject to the immediately preceding paragraph, to change their designated RPM or Project Coordinator. U.S. EPA shall notify the Respondents, and Respondents shall notify U.S. EPA, as early as possible before such a change is made, but in no case less than 24 hours before such a change. The initial notification may be made orally but it shall be promptly followed by a written notice.

2. Work to Be Performed

In Phase I, Respondents shall perform, at a minimum, the following time-critical removal actions:

a. Analysis and mapping of waste materials and contamination at the Facility for removal purposes, delineating:

   1. the location of all waste materials and the extent of contamination;

   2. the location of waste materials and contamination by toxicity; and

   3. waste materials and contamination by multimedia migratory potential; this should include but not be limited to an analysis of surface dust and dirt.

b. Long-term securing of the Facility against trespassers through use of fences, signs and other devices, as necessary.

c. Excavation, demolition, consolidation, and/or removal of highly contaminated buildings, structures, soils, loose waste materials, loose industrial by-products, construction materials, demolition debris, machinery, garbage, dusts, post-industrial debris and office or industrial equipment, where such actions will reduce the spread of, or direct contact with, the contamination.

d. Removal of drums, barrels, tanks, or other bulk containers that contain or may contain hazardous substances or pollutants or contaminants where such actions will reduce the likelihood of spillage or of exposure to humans, animals or the food chain.

e. Containment, treatment, disposal, or incineration of hazardous materials, where such action is necessary to reduce the likelihood of human, animal or food chain exposure.

In Phase II, Respondents shall develop and submit to U.S. EPA an EE/CA Report in accordance with the attached Scope of Work ("SOW"). This SOW is incorporated into and made an enforceable part of this Order.

The EE/CA Report shall be consistent with, at a minimum, U.S. EPA guidance entitled, "Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA", EPA/540-R-93-057, Publication 9360.32, PB 93-963402, dated August 1993.

Once the preferred alternative is chosen through an Action Memorandum developed by the U.S. EPA, in consultation with the Ohio EPA for the non-time critical removal, negoiations will begin with the Settling Defendants to implement the preferred alternative.

2.1 Phase I Work Plan

Within 15 business days after the effective date of this Order, the Respondents shall submit to U.S. EPA for approval and to Ohio EPA a draft Work Plan that is consistent with this Order for performing the Phase I time-critical removal activities set forth above. The draft Work Plan shall provide a description of, and an expeditious schedule for, the actions required by this Order.

U.S. EPA may approve, disapprove, require revisions to, or modify

the draft Work Plan. If U.S. EPA requires revisions, Respondents shall submit a revised draft Work Plan within seven business days of receipt of U.S. EPA's notification of required revisions.

In the event of U.S. EPA disapproval of the revised Work Plan, Respondents may be deemed in violation of this Order; however, approval shall not be unreasonably withheld by U.S. EPA. In such event, U.S. EPA retains the right to conduct its own Work Plan and obtain reimbursement for costs incurred in conducting the Work Plan from the Respondents.

Respondents shall implement the Work Plan as finally approved in writing by U.S. EPA in accordance with the schedule approved by U.S. EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be fully enforceable under this Order. Respondents shall notify U.S. EPA and Ohio EPA at least 48 hours prior to performing any on-Site work pursuant to the U.S. EPA-approved work plan.

Respondents shall not commence or undertake any removal actions at the Site without prior U.S. EPA approval.

2.2 Phase II EE/CA Report

Respondents shall submit the plans and reports required by the attached SOW in accordance with the schedule in the attached SOW. Respondents shall submit these plans and reports to U.S. EPA for approval, with a copy for review to Ohio EPA. These plans and reports shall be consistent with this Order and the SOW.

U.S. EPA may approve, disapprove, require revisions to, or modify any plan or report required by the attached SOW. If U.S. EPA requires revisions, Respondents shall submit a revised EE/CA Report incorporating all of U.S. EPA's required revisions within seven calendar days of receipt of U.S. EPA's notification of the required revisions.

In the event of U.S. EPA disapproval of the revised EE/CA Report, Respondents may be deemed in violation of this Order; however, approval shall not be unreasonably withheld by U.S. EPA. In such event, U.S. EPA retains the right to terminate this Order, conduct a complete EE/CA Report, and obtain reimbursement for costs incurred in conducting the EE/CA Report from the Respondents.

The revised report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this EE/CA Report, the information submitted is true, accurate, and complete.

Respondents shall not commence or undertake any removal actions at the Site without prior U.S. EPA approval.

2.3 Health and Safety Plan

Within 15 business days after the effective date of this Order, the Respondents shall submit to U.S. EPA and Ohio EPA for U.S. EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Order. This plan shall comply with applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910. If U.S. EPA determines it is appropriate, the plan shall also include contingency planning. Respondents shall incorporate all changes to the plan recommended by U.S. EPA, and implement the plan during the pendency of the removal action.

2.4 Quality Assurance and Sampling

All sampling and analyses performed pursuant to this Order shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control (QA/QC), data validation, and chain of custody procedures. Respondents shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with U.S. EPA guidance.

Upon request by U.S. EPA, Respondents shall have such a laboratory analyze samples submitted by U.S. EPA for quality assurance monitoring. Respondents shall provide to U.S. EPA the quality assurance/quality control procedures followed by all sampling teams and laboratories performing data collection and/or analysis. Respondents shall also ensure provision of analytical tracking information consistent with OSWER Directive No. 9240.0-2B, "Extending the Tracking of Analytical Services to PRP-Lead

Superfund Sites."

Upon request by U.S. EPA, Respondents shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples of any samples collected by Respondents or their contractors or agents while performing work under this Order. Respondents shall notify U.S. EPA not less than three business days in advance of any sample collection activity. U.S. EPA shall have the right to take any additional samples that it deems necessary.

2.5 Reporting

Respondents shall submit a monthly written progress report to U.S. EPA and Ohio EPA concerning actions undertaken pursuant to this Order, beginning 30 calendar days after the date of U.S. EPA's approval of the Work Plan, until termination of this Order, unless otherwise directed in writing by the RPM. These reports shall describe all significant developments during the preceding period, including the work performed and any problems encountered, analytical data received during the reporting period, and developments anticipated during the next reporting period, including a schedule of work to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

Any Respondent that owns any portion of the Site shall, at least 30 days prior to the conveyance of any interest in real property at the Site, give written notice of this Order to the transferee and written notice of the proposed conveyance to U.S. EPA and Ohio EPA. The notice to U.S. EPA and Ohio EPA shall include the name and address of the transferee. The party conveying such an interest shall require that the transferee will provide access as described in Section V.3 (Access to Property and Information).

2.6 Additional Work

In the event that the U.S. EPA or the Respondents determine that additional work, including EE/CA support sampling and/or an engineering evaluation, is necessary to accomplish the objectives of the EE/CA Report, notification of such additional work shall be provided to the other parties in writing. Any additional work that Respondents determine to be necessary shall be subject to U.S. EPA's written approval prior to commencement of the additional work. Respondents shall complete any additional work that they

have proposed, in accordance with standards, specifications and schedules that U.S. EPA has approved in writing. Respondents also shall complete any additional work that U.S. EPA has determined to be necessary and has provided written notice of pursuant to this paragraph, in accordance with standards, specifications and schedules as approved in writing by U.S. EPA.

2.7 Final Report

Within 60 calendar days after completion of all removal actions required under this Order, the Respondents shall submit to U.S. EPA and Ohio EPA for U.S. EPA review a final report summarizing the actions taken to comply with this Order. The final report shall conform to the requirements set forth in Section 300.165 of the NCP, 40 CFR § 300.165. The final report shall also include a good faith estimate of total costs incurred in complying with the Order, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destinations of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (e.g., manifests, invoices, bills, contracts, and permits).

The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete.

3. Access to Property and Information

Respondents shall provide or obtain access to the Site and off-Site areas to which access is necessary to implement this Order, and shall provide access to all records and documentation related to the conditions at the Site and the actions conducted pursuant to this Order. Such access shall be provided to U.S. EPA employees, contractors, agents, consultants, designees, representatives, and State of Ohio representatives, the latter including Ohio EPA.

These individuals shall be permitted to move freely at the Site and appropriate off-Site areas in order to conduct actions which U.S. EPA determines to be necessary. Respondents shall submit to U.S. EPA, upon request, the results of all sampling or tests and all other data generated by Respondents or their contractors, or on the Respondents' behalf during implementation of this Order.

Where work under this Order is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements within 14 calendar days after the effective date of this Order, or as otherwise specified in writing by the RPM. Respondents shall immediately notify U.S. EPA if, after using their best efforts, they are unable to obtain such agreements. Respondents shall describe in writing their efforts to obtain access. U.S. EPA may then assist Respondents in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as U.S. EPA deems appropriate. Respondents shall reimburse U.S. EPA for all costs and attorneys fees incurred by the United States in obtaining such access.

4. Record Retention, Documentation, Availability of Information

Respondents shall preserve all documents and information in their possession or the possession of their contractors, subcontractors or representatives, relating to work performed under this Order, or relating to the hazardous substances found on or released from the Site, for six years following completion of the removal actions required by this Order. At the end of this six year period and at least 60 days before any document or information is destroyed, Respondents shall notify U.S. EPA that such documents and information are available to U.S. EPA for inspection, and upon request, shall provide the originals or copies of such documents and information to U.S. EPA. In addition, Respondents shall provide documents and information retained under this Section at any time before expiration of the six year period at the written request of U.S. EPA.

5. Off-Site Shipments

All hazardous substances, pollutants or contaminants removed off-Site pursuant to this Order for treatment, storage or disposal shall be treated, stored, or disposed of at a facility in

compliance, as determined by U.S. EPA, with the U.S. EPA Off-Site Rule, 40 C.F.R. § 300.440, 58 Fed. Reg. 49215 (Sept. 22, 1993).

6. Compliance With Other Laws

Respondents shall perform all actions required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as provided in CERCLA Section 121(e), 42 U.S.C. § 9621(e), and 40 C.F.R. § 300.415(I). In accordance with 40 C.F.R. § 300.415(I), all on-Site actions required pursuant to this Order shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws.

7. Emergency Response and Notification of Releases

If any incident, or change in Site conditions during the activities conducted pursuant to this Order causes or threatens to cause an additional release of hazardous substances from the Site or an endangerment to the public health, welfare, or the environment, the Respondents shall immediately take all appropriate action to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify the RPM or, in the event of his unavailability, shall notify the Regional Duty Officer, Emergency Response Branch, Region 5 at (312) 353-2318, of the incident or Site conditions. If Respondents fail to immediately take all apppropriate actions, U.S. EPA may respond to the release or endangerment and reserve the right to recover costs associated with that response.

Respondents shall submit a written report to U.S. EPA and Ohio EPA within seven business days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. Respondents shall also comply with any other notification requirements, including those in CERCLA Section 103, 42 U.S.C. § 9603, and Section 304 of the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. § 11004.

VI. AUTHORITY OF THE U.S. EPA REMEDIAL PROJECT MANAGER

The RPM shall be responsible for overseeing the implementation of this Order. The RPM shall have the authority vested in an RPM by the NCP, including the authority to halt, conduct, or direct any work required by this Order, or to direct any other response action undertaken by U.S. EPA or Respondents at the Site. Absence of the RPM from the Site shall not be cause for stoppage of work unless specifically directed by the RPM.

VII. REIMBURSEMENT OF COSTS

Respondents shall pay all past response costs, and oversight costs, of the United States related to the Site that are not inconsistent with the NCP. As soon as practicable after the effective date of this Order, U.S. EPA will send Respondents a bill for "past response costs" at the Site. U.S. EPA's bill will include an Itemized Cost Summary. "Past response costs" are all costs, including, but not limited to, direct and indirect costs and interest, that the United States, its employees, agents, contractors, consultants, and other authorized representatives incurred and paid with regard to the Site prior to the date through which the Itemized Cost Summary runs.

In addition, U.S. EPA will send Respondents a bill for "oversight costs" on an annual basis. "Oversight costs" are all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this AOC. "Oversight costs" shall also include all costs, including direct and indirect costs, paid by the United States in connection with the Site between the date through which the U.S. EPA's Itemized Cost Summary for "past response costs" ran and the effective date of this AOC.

Respondents shall, within 30 calendar days of receipt of a bill, remit a cashier's or certified check for the amount of the bill made payable to the "Hazardous Substance Superfund," to the following address:

U.S. Environmental Protection Agency

Superfund Accounting
P.O. Box 70753
Chicago, Illinois 60673

Respondents shall simultaneously transmit a copy of the check to the Director, Superfund Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois, 60604-3590. Payments shall be designated as "Response Costs - Master Metals Site" and shall reference the payors' names and addresses, the U.S. EPA site identification number (number), and the docket number of this Order.

In the event that any payment is not made within the deadlines described above, Respondents shall pay interest on the unpaid balance. Interest is established at the rate specified in Section 107(a) of CERCLA, 42 U.S.C. § 9607(a). The interest shall begin to accrue on the date of the Respondents' receipt of the bill (or for past response costs, on the effective date of this Order). Interest shall accrue at the rate specified through the date of the payment. Payments of interest made under this paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section.

Respondents may dispute all or part of a bill for oversight costs submitted under this Order, if Respondents allege that U.S. EPA has made an accounting error, or if Respondents allege that a cost item is inconsistent with the NCP.

If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondents shall pay the full amount of the uncontested costs into the Hazardous Substance Fund as specified above on or before the due date. Within the same time period, Respondents shall pay the full amount of the contested costs into an interest-bearing escrow account. Respondents shall simultaneously transmit a copy of both checks to the RPM. Respondents shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which they prevailed from the escrow funds plus interest within 20 calendar days after the dispute is resolved.

VIII. DISPUTE RESOLUTION

The parties to this Order shall attempt to resolve, expeditiously and informally, any disagreements concerning this Order.

If the Respondents object to any U.S. EPA action taken pursuant to this Order, including billings for response costs, the Respondents shall notify U.S. EPA in writing of their objection within 10 calendar days of such action, unless the objections have been informally resolved. This written notice shall include a statement of the issues in dispute, the relevant facts upon which the dispute is based, all factual data, analysis or opinion supporting Respondents' position, and all supporting documentation on which Respondents rely (hereinafter the "Statement of Position").

U.S. EPA and Respondents shall within 15 calendar days of U.S. EPA's receipt of the Respondents' Statement of Position, attempt to resolve the dispute through formal negotiations (Negotiation Period). The Negotiation Period may be extended at the sole discretion of U.S. EPA. U.S. EPA's decision regarding an extension of the Negotiation Period shall not constitute a U.S. EPA action subject to dispute resolution or a final Agency action giving rise to judicial review.

An administrative record of any dispute under this Section shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, and the Statement of Position served pursuant to the preceding paragraph.

Any agreement reached by the parties pursuant to this Section shall be in writing, signed by all parties, and shall upon the signature by the parties be incorporated into and become an enforceable element of this Order. If the parties are unable to reach an agreement within the Negotiation Period, U.S. EPA will issue a written decision on the dispute to the Respondents. The decision of U.S. EPA shall be incorporated into and become an enforceable element of this Order upon Respondents' receipt of the U.S. EPA decision regarding the dispute.

Respondents' obligations under this Order shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the

subject of the dispute in accordance with the agreement reached or with U.S. EPA's decision, whichever occurs. No U.S. EPA decision made pursuant to this Section shall constitute a final Agency action giving rise to judicial review.

IX. FORCE MAJEURE

Respondents agree to perform all requirements under this Order within the time limits established under this Order, unless the performance is delayed by a force majeure. For purposes of this Order, a force majeure is defined as any event arising from causes beyond the control of Respondents or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, that delays or prevents performance of any obligation under this Order despite Respondents' best efforts to fulfill the obligation. Force majeure does not include financial inability to complete the work or increased cost of performance.

Respondents shall notify U.S. EPA orally within 24 hours after Respondents become aware of any event that Respondents contend constitutes a force majeure, and in writing within seven calendar days after the event. Such notice shall: identify the event causing the delay or anticipated delay; estimate the anticipated length of delay, including necessary demobilization and re-mobilization; state the measures taken or to be taken to minimize the delay; and estimate the timetable for implementation of the measures. Respondents shall take all reasonable measures to avoid and minimize the delay. Failure to comply with the notice provision of this Section shall be grounds for U.S. EPA to deny Respondents an extension of time for performance. Respondents shall have the burden of demonstrating by a preponderance of the evidence that the event is a force majeure, that the delay is warranted under the circumstances, and that best efforts were exercised to avoid and mitigate the effects of the delay.

If U.S. EPA determines a delay in performance of a requirement under this Order is or was attributable to a force majeure, the time period for performance of that requirement shall be extended as deemed necessary by U.S. EPA. Such an extension shall not alter Respondents' obligation to perform or complete other tasks required by the Order which are not directly affected by the force majeure.

X. STIPULATED AND STATUTORY PENALTIES

For each day, or portion thereof, that Respondents fail to fully perform any requirement of this Order in accordance with the schedule established pursuant to this Order, Respondents shall be liable as follows:

Deliverable/Activity	Penalty For Days 1-7	Penalty For More Than 7 Days
Failure to Submit a Draft Work Plan or EE/CA Report	$750/Day	$2,000/Day
Failure to Submit a Revised Work Plan or EE/CA Report	$750/Day	$2,000/Day
Late Submittal of Progress Reports or Other Miscellaneous Reports/Submittals	$200/Day	$500/Day
Failure to Meet any Scheduled Deadline in the Order	$200/Day	$500/Day

Upon receipt of written demand by U.S. EPA, Respondents shall make payment to U.S. EPA within 20 days and interest shall accrue on late payments in accordance with Section VII of this Order (Reimbursement of Costs).

Even if violations are simultaneous, separate penalties shall accrue for separate violations of this Order. Penalties accrue and are assessed per violation per day. Penalties shall accrue regardless of whether U.S. EPA has notified Respondents of a violation or act of noncompliance. The payment of penalties shall

not alter in any way Respondents' obligations to complete the performance of the work required under this Order. Stipulated penalties shall accrue, but need not be paid, during any dispute resolution period concerning the particular penalties at issue. If Respondents prevail upon resolution, Respondents shall pay only such penalties as the resolution requires. In its unreviewable discretion, U.S. EPA may waive its rights to demand all or a portion of the stipulated penalties due under this Section. Such a waiver must be made in writing.

The stipulated penalties set forth above shall not be the sole or exclusive remedy for violations of this Order. Violation of any provision of this Order may subject Respondents to civil penalties of up to $25,000 per violation per day, as provided in Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1). Respondents may also be subject to punitive damages in an amount up to three times the amount of any cost incurred by the United States as a result of such violation, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Should Respondents violate this Order or any portion hereof, U.S. EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606.

XI. RESERVATION OF RIGHTS

Except as specifically provided in this Order, nothing herein shall limit the power and authority of U.S. EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent U.S. EPA from seeking legal or equitable relief to enforce the terms of this Order. U.S. EPA also reserves the right to take any other legal or equitable action as it deems appropriate and necessary, or to require the Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law.

XII. OTHER CLAIMS

By issuance of this Order, the United States and U.S. EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or U.S. EPA shall not be a party or be held out as a party to any contract entered into by the Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out activities pursuant to this Order.

Except as expressly provided in Section XIII (Covenant Not To Sue), nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against the Respondents or any person not a party to this Order, for any liability such person may have under CERCLA, other statutes, or the common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106(a) or 107(a) of CERCLA, 42 U.S.C. §§ 9606(a), 9607(a).

This Order does not constitute a preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). The Respondents waive any claim to payment under Sections 106(b), 111, and 112 of CERCLA, 42 U.S.C. §§ 9606(b), 9611, and 9612, against the United States or the Hazardous Substance Superfund arising out of any action performed under this Order.

No action or decision by U.S. EPA pursuant to this Order shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XIII. COVENANT NOT TO SUE

Except as otherwise specifically provided in this Order, upon issuance of the U.S. EPA notice referred to in Section XVII (Notice of Completion), U.S. EPA covenants not to sue Respondents for judicial imposition of damages or civil penalties or to take administrative action against Respondents for any failure to perform removal actions agreed to in this Order except as otherwise reserved herein.

Except as otherwise specifically provided in this Order, in

consideration and upon Respondents' payment of the response costs specified in Section VII of this Order, U.S. EPA covenants not to sue or to take administrative action against Respondents under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), for recovery of past and oversight costs incurred by the United States in connection with this removal action and this Order. This covenant not to sue shall take effect upon the receipt by U.S. EPA of the payments required by Section VII (Reimbursement of Costs).

These covenants not to sue are conditioned upon the complete and satisfactory performance by Respondents of their obligations under this Order. These covenants not to sue extend only to the Respondents and do not extend to any other person.

XIV. CONTRIBUTION PROTECTION

With regard to claims for contribution against Respondents for matters addressed in this Order, the Parties hereto agree that the Respondents are entitled to protection from contribution actions or claims to the extent provided by Section 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4).

Nothing in this Order precludes Parties from asserting any claims, causes of action or demands against any persons not parties to this Order for indemnification, contribution, or cost recovery.

XV. INDEMNIFICATION

Respondents agree to indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action: (A) arising from, or on account of, acts or omissions of Respondents and Respondents' officers, heirs, directors, employees, agents, contractors, subcontractors, receivers, trustees, successors or assigns, in carrying out actions pursuant to this Order; and (B) for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents, and any persons for performance of work on or relating to the Site, including claims on account of construction delays. Nothing in this Order, however, requires indemnification by Respondents for any claim or cause of action against the United States based on negligent action taken solely

and directly by U.S. EPA (not including oversight or approval of plans or activities of the Respondents).

XVI. MODIFICATIONS

Except as otherwise specified in Sections V.2., V.2.1 and V.2.2 (Work To Be Performed, Work Plan and EE/CA Report), if any party believes modifications to any plan or schedule are necessary during the course of this project, that party shall conduct informal discussions regarding such modifications with the other parties. Any agreed-upon modifications to any plan or schedule shall be memorialized in writing within seven business days; however, the effective date of the modification shall be the date of the RPM's oral direction. Any other requirements of this Order may be modified in writing by mutual agreement of the parties. Any modification to this Order shall be incorporated into and made an enforceable part of this Order.

If Respondents seek permission to deviate from any approved plan or schedule, Respondents' Project Coordinator shall submit a written request to U.S. EPA for approval outlining the proposed modification and its basis.

No informal advice, guidance, suggestion, or comment by U.S. EPA regarding reports, plans, specifications, schedules, or any other writing submitted by the Respondents shall relieve Respondents of their obligations to obtain such formal approval as may be required by this Order, and to comply with all requirements of this Order unless it is formally modified.

XVII. NOTICE OF COMPLETION

When U.S. EPA determines, after U.S. EPA's review of the Final Report, that all work has been fully performed in accordance with this Order, except for certain continuing obligations required by this Order (e.g., record retention, payment of costs), U.S. EPA will provide written notice to the Respondents. If U.S. EPA determines that any removal activities have not been completed in accordance with this Order, U.S. EPA will notify the Respondents, provide a list of the deficiencies, and require that Respondents modify the Work Plan or the revised EE/CA Report if appropriate to

correct such deficiencies.

XVIII. SUBMITTALS/CORRESPONDENCE

Any notices, documents, information, reports, plans, approvals, disapprovals, or other correspondence required to be submitted from one party to another under this Order, shall be deemed submitted either when hand-delivered or as of the date of receipt by certified mail/return receipt requested, express mail, or facsimile.

Submissions to Respondents shall be addressed to:

With copies to:

Submissions to U.S. EPA shall be addressed to:

Thomas Alcamo
U.S. EPA - Region 5
77 West Jackson Boulevard, SR-6J
Chicago, Illinois 60604-3590

With copies to:

Kris Vezner
Assistant Regional Counsel
U.S. EPA - Region 5
77 W. Jackson Boulevard, C-29A
Chicago, Illinois 60604-3590

Submissions to Ohio EPA shall be addressed to:

Bart Ray
Ohio EPA
Northeast District Office-DERR
2110 E. Aurora Rd.
Twinsburg OH 44087

XIX. SEVERABILITY

If a court issues an order that invalidates any provision of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated by the court's order.

XX. EFFECTIVE DATE

This Order shall be effective upon signature by the Director, Superfund Division, U.S. EPA Region 5.

IN THE MATTER OF:

Master Metals, Inc.
Cleveland, Ohio

SIGNATORIES

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this _____ day of _____, 199_.

By _____
(Signature)

Print: Name: _____

On Behalf of: _____

Address: _____

_____

IT IS SO ORDERED AND AGREED

BY: _____ DATE: 4/17/97

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

SCOPE OF WORK FOR ENGINEERING EVALUATION/COST ANALYSIS AT MASTER METALS, INC. SITE CLEVELAND, OHIO

I. PURPOSE

The purpose of this Scope of Work (SOW) is to set forth requirements for the preparation of an Engineering Evaluation/Cost Analysis (EE/CA) which shall evaluate alternatives for conducting a removal action at a portion of the Master Metals, Incorporated Site. Respondents shall furnish all personnel, materials, and services necessary for, or incidental to, performing the EE/CA at the Master Metals, Inc. Site, except as otherwise specified herein.

II. SITE BACKGROUND

The Master Metals, Incorporated ("MMI") Site is comprised of both (a) the MMI facility property and surrounding areas (the "Facility") and (b) a nearby set of residential properties and surrounding areas where MMI lead-bearing materials were deposited as fill (the "Holmden Properties"). Though the Holmden Properties are part of the Site, the work associated with this SOW addresses only the Facility and not the Holmden Properties.

The MMI Facility is located in the "flats" area of downtown Cleveland, in an industrialized sector of the City. This property encompasses 4.3 acres. It is bordered on two sides by railroad tracks, with an LTV Steel facility located immediately to the east and south. The Cuyuhoga River is located approximately 1,500 feet to the east. A playground and athletic field is located approximately 1,500 feet to the west. The nearest residential area begins approximately 2,000 feet to the northwest.

Areas of contamination:

MMI Facility: sampling and testing of Site soils by Ohio EPA and U.S. EPA have revealed extensive lead soil and groundwater contamination at the Facility. Arsenic, cadmium and other metals are also present in the soil. Numerous specific Facility buildings and waste storage areas on the Facility are also contaminated with lead. The Facility also has several areas still containing lead waste open and exposed to the environment. The Facility's dust is lead-bearing and toxic.

Site History:

1932: National Lead constructs the Facility on a slag fill. It operates the Facility as a secondary lead smelter and engages in battery cracking as part of its operations.

1979: MMI purchases the Facility, continuing to run it as a secondary lead smelter; MMI receives lead-bearing materials from off-Site sources.

1980: MMI files a Part A permit to obtain interim operating status under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 et seq.

1985: MMI submits Part B permit application. MMI loses RCRA interim operating status (suffers LOIS).

1987: MMI submits a partial closure plan to U.S. EPA. U.S. EPA conducts an investigation of the Facility as part of the plan.

1990: MMI contractor conducts an investigation of the Facility.

1991: Ohio EPA conducts an investigation of the Facility.

1992: U.S. EPA technical assistance team and Ohio EPA conduct separate investigations of the Facility.

1993: Ohio EPA shuts down the Facility; U.S. EPA conducts an investigation of the Facility.

1995: U.S. EPA internally defers the Site from RCRA to CERCLA; MMI formally withdraws its remaining permits, effectively terminating its ability to legally handle hazardous waste.

III. SCOPE

Respondents shall complete the following tasks as part of this EE/CA:

Task 1. EE/CA Work Plan
Task 2. EE/CA Support Sampling Plan
Task 3. EE/CA Support Sampling
Task 4. EE/CA Data Report
Task 5. EE/CA Report

TASK 1: EE/CA WORK PLAN

As described in Section IV., Deliverables, the Respondents shall submit a Work Plan for the EE/CA. The objective of the Work Plan is to provide U.S. EPA with a project description and outline of the overall technical approach for completing the EE/CA. The work plan shall identify all tasks, budget, and schedule to accomplish the Scope of Work. The plan shall document the responsibility and authority of all organizations and key personnel involved with the

implementation of the Work Plan and shall include a description of the qualifications of key personnel involved with the EE/CA. Work plan preparation shall require coordination and review and approval by U.S. EPA.

As an attachment to the Work Plan, Respondents shall prepare a Site safety plan which is designed to protect on-Site personnel, area residents and nearby workers from physical, chemical and all other hazards posed by this event. The safety plan shall develop the performance levels and criteria necessary to address the following areas:

- General requirements
- Personnel
- Levels of protection
- Safe work practices and safe guards
- Medical surveillance
- Personal and environmental air monitoring
- Personal hygiene
- Decontamination - personal and equipment
- Site work zones
- Contaminant control
- Contingency and emergency planning
- Logs, reports and record keeping

The safety plan shall at a minimum follow U.S. EPA guidance, including but not limited to the document Standard Operating Safety Guides (Publication 9285.1-03, PB92-963414, June 1992), as well as all OSHA requirements as outlined in 29 CFR 1910. The Site Safety Plan for the time-critical removal action may be updated to reflect this non-time critical removal action.

TASK 2: EE/CA SUPPORT SAMPLING PLAN

Respondents shall submit a Support Sampling Plan pursuant to the schedule in the Deliverables section that addresses all data acquisition activities. The objective of the EE/CA support sampling is to further determine the extent of contamination from the MMI Facility for on-Site and off-Site soil, groundwater and sewer system facilities, piping and media. The Holmden Properties will not be part of this support sampling. Respondents shall include any necessary sampling beyond previous soil and groundwater sampling. Previous sampling events shall be used to assist in determining future sampling locations. The plan shall contain a description of equipment specifications, required analyses, sample types, and sample locations and frequency. The plan shall address specific hydrologic, hydrogeologic, and air transport characterization methods including, but not limited to, field screening, drilling and well installation, flow determination, and soil/water/sludge sampling to determine extent of contamination.

Respondents shall identify the data requirements of specific remedial technologies that may be necessary to evaluate removal activities in the EE/CA. Respondents shall provide a schedule stating when events will take place and when the EE/CA Data Report will be submitted.

The EE/CA Support Sampling Plan shall include the following information:

A. Site Background

A brief summary of the Facility location, general Facility physiography, hydrology and geology shall be included. A description of the data already available shall be included which will highlight the areas of known contamination and the levels detected. Tables shall be included to display the minimum and maximum levels of detected contaminants across the Facility.

B. Data Gap Description

Respondents shall make an analysis of the currently available data to determine the areas of the Facility which require additional data in order to define the extent of contamination for purposes of implementing a removal action. A description of the number, types, and locations of additional samples to be collected shall be included in this section of the sampling plan.

Descriptions of the following activities shall also be included:

i. Waste Characterization
Respondents shall include a program for characterizing the waste materials at the Facility. Waste materials include but are not limited to soils, loose waste materials, loose industrial by-products, construction materials, demolition debris, machinery, garbage, dusts, post-industrial debris and office or industrial equipment disposed of or present at the Facility above or below the ground. This activity shall include an analysis of current information/data on past disposal practices at the Facility.

ii. Hydrogeologic Investigation
Respondents shall include a program for determining the present and potential extent of groundwater contamination around the Facility. The plan shall include the degree of hazard, the mobility of pollutants, discharges/recharge areas, regional and local flow direction and quality, and local uses of groundwater. The plan shall also develop a strategy for determining horizontal and vertical distribution of contaminants. Upgradient samples shall be included in the plan.

iii. Soils Investigation

Respondents shall include a program to determine the extent of contamination of surface and subsurface soils both on-Facility and off-Facility.

iv. *Air Investigation*
Respondents shall include a program to determine the present and potential extent of atmospheric contamination from the various source areas at the Facility. The program shall address (a) the tendency of the substances identified through the waste characterization to enter the atmosphere; (b) local wind patterns; and (c) the degree of hazard.

v. *Sewer Investigation*
Respondents shall include a program to determine if the sewers located near the Facility have been affected or contaminated by the MMI Site.

C. ***Sampling Procedures***

Respondents shall include a description of the depths of sampling, parameters to be analyzed, equipment to be used, decontamination procedures to be followed, sample quality assurance, data quality objectives and sample management procedures to be utilized in the field.

D. ***Schedule***

Respondents shall include a schedule which identifies timing for initiation and completion of all tasks to be completed as part of this EE/CA Support Sampling Plan.

TASK 3: EE/CA SUPPORT SAMPLING

Respondents shall conduct the EE/CA Support Sampling activity according to the approved Sampling Plan and schedule. Respondents shall coordinate activities with U.S. EPA's Remedial Project Manager (RPM). Respondents shall provide the RPM with all laboratory data.

TASK 4: EE/CA DATA REPORT

According to the U.S. EPA-approved schedule in the EE/CA Support Sampling Plan, a report, in table form, shall be provided by Respondents to U.S. EPA. This report shall summarize the sampling results from both the EE/CA Support Sampling and from previous sampling events. If requested, copies of all raw data shall be provided by Respondents to U.S. EPA for a validation check.

TASK 5: ENGINEERING EVALUATION/COST ANALYSIS REPORT (EE/CA)

As required by section 300.415(b)(4) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), an EE/CA must be completed for all non-time critical removal actions under CERCLA. The goals of an EE/CA are to identify the objectives of the removal action and to analyze costs, effectiveness, and implementabiltiy of the various alternatives that may be used to satisfy these objectives. The EE/CA will conform to any guidance provided by U.S. EPA.

Respondents shall include the following sections in the EE/CA for the Master Metals Facility:

1. Executive Summary

2. Site Characterization

   2.1 Site Description and Background
      2.1.1 Facility Location and Physical Setting
      2.1.2 Present and Past Facility Operations
      2.1.3 Current and Past Owners/Operators
      2.1.4 Geology/Hydrology/Hydraulics
      2.1.5 Surrounding Land Use and Populations
      2.1.6 Sensitive Ecosystems
      2.1.7 Meteorology
   2.2 Previous Removal Actions
   2.3 Source, Nature, and Extent of Contamination
   2.4 Analytical Data
   2.5 Streamlined Risk Evaluation
      2.5.1 Human Health Risks
      2.5.2 Ecological Risks

3. Identification of Removal Action Objectives

   3.1 Determination of Removal Scope
   3.2 Determination of Removal Schedule

4. Identification and Analysis of Removal Action Alternatives

   4.1 Overall Protection of Public Health and the Environment
   4.2 Compliance with ARARs and Other Criteria, Advisories, and Guidance
   4.3 Long-Term Effectiveness and Permanence
      4.3.1 Magnitude of Residual Risk
      4.3.2 Adequacy and Reliability of Controls
   4.4 Reduction of Toxicity, Mobility, or Volume Through Treatment
   4.5 Short-Term Effectiveness
      4.5.1 Protection of the Community
      4.5.2 Protection of the Workers
      4.5.3 Environmental Impacts

1. Executive Summary

The Executive Summary shall provide a general overview of the contents of the EE/CA. It shall contain a brief discussion of the Facility and the current and/or potential threat posed by conditions at the Facility. It shall also identify the scope and objectives of the removal action and discuss the alternative responses.

2. Site Characterization

The Site Characterization shall summarize available data on the physical, demographic, and other characteristics of the Facility and surrounding areas. Specific topics that shall be addressed in the Site Characterization are detailed below. The Site Characterization shall concentrate on those characteristics necessary to evaluate and select an appropriate remedy.

2.1 Site Description and Background

The Site Description includes current and historical information. The following information shall be included where available and as appropriate given Site-specific conditions and the scope of the removal action. Other information shall also be included in the Site Description and Background where appropriate. The fact and information categories listed as subheadings to 2.1.1-2.1.7, below, are merely mandatory minimum components of 2.1.1-2.1.7. The 2.1.1-2.1.7 components are not limited to these data categories and other types of information shall also be included therein where appropriate.

2.1.1 Facility Location and Physical Setting

- USGS topographic map quadrangle
- Latitude/longitude
- Facility size/dimensions
- Boundary descriptions
- Land cover/vegetation/stresses to topography
- Utilities/transportation features
- Buildings/structures/improvements (including relative condition)
- Surface water bodies/conveyances
- Drainage channels/pathways
- Historically/archaeologically significant features

2.1.2 Present and Past Facility Operations

- Materials manufactured, stored, or disposed on-Facility
- Quantities of each contaminant and potential hazards
- Years of operation
- Present/prior Facility use
- Regulatory history, including previous responses, investigations and litigation by State, local, and Federal agencies

2.1.3 Current and Past Owners/Operators

- Names and addresses
- Names, telephone numbers, and titles of company representatives

2.1.4 Geology/Hydrology/Hydraulics

- Depth to aquifer(s)
- Soil types (surface and vadose zones)
- Local geological formations
- Surface water hydrology and hydrogeology (including watershed characterization)

2.1.5 Surrounding Land Use and Populations

- Residential, industrial, or commercial land
- Possible pathways of exposure
- Identification of sensitive populations
- Estimate of population densities within affected radius
- Description of drinking water sources
- Description of surface water uses (i.e., recreational or commercial)

2.1.6 Sensitive Ecosystems

- Wetlands, wildlife breeding areas (include maps)

- Wild and scenic rivers
- Connection to the human food chain or food of other organisms
- Sensitive and/or endangered species

2.1.7 Meteorology

- Rainfall/snowfall
- Temperature ranges
- Wind conditions
- Storm events (i.e., expected volumes entering watershed areas)

2.2 Previous Removal Actions

The Site Characterization section shall also describe in detail any previous removal actions at the Facility.

- Scope and objectives of the previous removal action(s)
- Amount of time spent on the previous removal action(s)
- Nature and extent of hazardous substances, pollutants, or contaminants treated or controlled during the previous removal action(s)
- Technologies used and/or treatment levels used for the previous removal action(s).

2.3 Source, Nature and Extent of Contamination

Site characterization data from previous sampling events should be included in this section, including tables to display the analytical data results. A description of the location of contaminants, the source of the contaminants, the type of contaminants found, the quantity, volume and magnitude of contamination, physical and chemical attributes of the hazardous substances, pollutants, or contaminants should be included.

A description of the current stability of the areas of contamination should be included and a description of the potential for further releases should also be included.

2.4 Analytical Data

This section shall present the available data, including, but not limited to, soil and groundwater sampling results. Data developed in previous investigations shall also be included.

2.5 *Streamlined Risk Evaluation*

The Respondents shall perform a streamlined risk evaluation using U.S. guidance. Prior to beginning the risk evaluation, the Respondents shall meet with the U.S. EPA to discuss an outline of the risk evaluation, including use of the U.S. EPA approved model and required assumptions to be used in the modeling exercise.

2.5.1 Human Health Risks

The contractor shall complete a streamlined risk evaluation that identifies the chemicals of concern at the Facility, provides an estimate of how and to what extent people might be exposed to these chemicals, and provides an assessment of the health effects associated with these chemicals. The risk evaluation shall project the potential risk of health problems occurring if no cleanup action is taken at the Facility.

The contractor shall refer to OSWER Publication 9285.7-01B, "Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual, Part A, Interim Final" (December 1989), EPA/540/1-89/002, PB90-155581, for guidance on completing the streamlined risk evaluation.

2.5.2 Ecological Risks

The contractor shall complete a streamlined risk evaluation that identifies the chemicals of concern at the Facility, provides an estimate of how and to what extent ecological habitats might be exposed to these chemicals, and provides an assessment of the effects associated with these chemicals on various habitats.

This section shall also include a description of the study area's flora, fauna, and endangered/threatened species, wetlands and aquatic environment.

3. Identification of Removal Action Objectives

The EE/CA shall develop specific removal action objectives, taking into consideration the following factors:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants;

- Actual or potential contamination of drinking water supplies or sensitive ecosystems;

•Hazardous substances in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;

•High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate;

•Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

•Threat of fire or explosion; and

•Other situations or factors that may pose threats to public health, welfare, or the environment.

3.1 Determination of Removal Scope

The EE/CA shall define the broad scope and specific objectives of the removal action and address the protectiveness of the removal action. The EE/CA shall discuss how the goals of the removal action are consistent with any potential long-term remediation.

3.2 Determination of Removal Schedule

Respondents shall include a general schedule for completing the removal action in the EE/CA. The schedule should include a start date for the removal taking into account time needed for design, and giving consideration of optimum weather conditions for conducting a removal action.

4. Identification and Analysis of Removal Action Alternatives

Based on the analysis of the nature and extent of contamination, and on the removal objectives developed in the previous section, this section shall identify and assess a limited number of alternatives that are appropriate for addressing the removal action objectives. This alternatives selection process shall also consider the CERCLA preference for treatment over conventional containment or land disposal approaches. The need for treatability studies shall be identified at this point.

Based on the available information, only the most qualified technologies that apply to the media or source of contamination shall be discussed in the EE/CA. The use of presumptive remedy guidance may also provide an immediate focus to the identification and analysis of alternatives.

Presumptive remedies involve the use of remedial technologies that have been consistently selected at similar sites or for similar contamination.

A limited number of alternatives, including any identified presumptive remedies, shall be selected for detailed analysis. Each of the alternatives shall be described with enough detail so that the entire treatment process can be understood. Technologies that may apply to the media or source of contamination shall be listed into the EE/CA. In some cases, it may be more appropriate to consider only a category of technologies. For example, on-Site incineration would be considered a technology category that may include rotary kiln, fluidized bed, etc.

Each alternative identified shall include a process description, a section regarding the advantages and disadvantages of the alternative, throughput rates, material handling requirements, operation and maintenance, residual disposal considerations, unit costs, and overall estimated costs.

The contractor shall also evaluate each alternative against the scope of the removal action and against each of the specific objectives for final disposition of the wastes and the level of cleanup desired. These objectives shall be discussed in terms of protectiveness of public health and the environment.

The objectives to be evaluated are:

4.1 Overall Protection of Public Health and the Environment

This discussion shall evaluate the degree to which the technology would effectively mitigate threats to public health and the environment. A discussion of how well each alternative is protective of public health and the environment should be provided in a consistent manner. The assessment of protection draws on assessments conducted under other evaluation criteria, including long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Evaluation shall focus on how each alternative achieves adequate protection and describes how the alternative will reduce, control, or eliminate risks at the Site through the use of treatment, engineering, or institutional controls. Any unacceptable short-term impacts should be identified in this evaluation.

4.2 Compliance with ARARs and Other Criteria, Advisories, and Guidance

The detailed analysis shall summarize which requirements are applicable or relevant and appropriate to an alternative and describe how the alternative meets

those requirements. A summary table may be employed to list potential ARARs. All activities conducted as part of this removal action shall be performed in accordance with the requirements of all federal and state laws and regulations. In addition to ARARs, U.S. EPA may identify other Federal or State advisories, criteria, or guidance to be considered (TBC) for a particular release. TBCs are not required by the NCP; rather, TBCs are meant to complement the use of ARARs.

4.3 Long-Term Effectiveness and Permanence

This section shall include an evaluation to assess the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes at the Facility. The following components shall be considered for each alternative:

4.3.1 Magnitude of Residual Risk

This factor shall evaluate the effectiveness of the alternative, and assesses the risk from waste and residuals remaining at the conclusion of Site activities. The factor also evaluates whether the alternative contributes to future remedial objectives.

4.3.2 Adequacy and Reliability of Controls

Once the removal action is complete, there may be a need to maintain Post Removal Site Control (PRSC), which refers to those response activities that are necessary to sustain the integrity of a removal action following its conclusion.

4.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Respondents shall address U.S. EPA's policy of preference for treatment (i.e., for technologies that will permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element). This evaluation shall also be based upon the following components:

- The treatment process(es) employed and the material(s) that it will treat
- The amount of the hazardous materials to be destroyed or treated
- The degree of reduction expected in toxicity, mobility, or volume
- The degree to which treatment will be irreversible
- The type and quantity of residuals that will remain after treatment
- Whether the alternative will satisfy the preference for treatment

4.5 *Short-Term Effectiveness*

Respondents shall address the effects of the alternative during implementation until the removal objectives have been met. Each alternative shall be evaluated with respect to their effects on human health and the environment following implementation of the action. The following components shall be addressed for each alternative:

4.5.1 Protection of the Community

This factor shall address any risk to the community that results from implementation of the proposed action, whether from air quality impacts, fugitive dusts, transportation of hazardous materials, or other sources.

4.5.2 Protection of the Workers

This factor shall assess threats that may be posed to Facility workers and the effectiveness and reliability of protective measures that would be taken.

4.5.3 Environmental Impacts

The potential adverse environmental impacts from the implementation of each alternative would be evaluated with this factor. The factor also assesses the reliability of mitigation measures in preventing or reducing the potential impacts.

4.5.4 Time Until Response Objectives are Achieved

This is an estimate of the time needed to achieve protection for the Facility itself or for individual elements or threats associated with the Facility.

4.6 *Technical Feasibility*

The contractor shall provide an assessment of the technical difficulties associated with a technology. These difficulties were initially identified during the development of alternatives and are addressed again in detail for the alternative as a whole. Each alternative shall be evaluated for:

- The degree of difficulty in constructing and operating the technology
- The reliability of the technology, including but not limited to the frequency or complexity of equipment maintenance or controls

•The availability of necessary services and materials, including but not limited to the alternative's need for raw materials or a large technical staff
•The scheduling aspects of implementing the alternative during and after implementation
•The ability to monitor the effectiveness of the alternative, including but not limited to the frequency or complexity of equipment maintenance or controls
•The potential impacts on the local community during construction operation
•The environmental conditions with respect to set-up and construction and operation
•Compatibility with potential future remedial actions

4.7 Administrative Feasibility

The administrative feasibility factor evaluates those activities needed to coordinate with other offices and agencies. The administrative feasibility of each alternative shall be evaluated, including the need for off-Site permits, adherence to applicable non-environmental laws, and concerns of other regulatory agencies. Other components that shall be considered include, but are not limited to, statutory limits, permits and waivers.

4.8 Availability of Services and Materials

The contractor shall address the availability of sufficient off-Site treatment, storage, and disposal capacity, equipment, services and materials, and other necessary resources to implement an alternative. The availability of an alternative refers to whether the equipment, materials, and personnel can be secured in time to maintain the removal schedule. Other components that shall be considered and are related to the availability of implementing the alternative include:

4.8.1 Personnel and Technology Availability

It should be determined whether a specific removal action alternative will be available from the manufacturer so that the schedule can be met. Other technologies may require a large number of skilled laborers or specialists that may not be readily available.

4.8.2 Off-Site Treatment, Storage, and Disposal

If off-Site removal and treatment of the waste is being considered, the EE/CA shall address the adequacy of off-Site treatment, storage, and disposal capacity. It should also be determined if the treatment facility

accepting the material is in compliance with the off-Site policy and can accept the type of CERCLA waste at the Facility.

4.8.3 Availability of Services and Materials

This involves a consideration of such services as laboratory testing capacity and turnaround for chemical analyses, adequate supplies and equipment for on-Facility activities, or installation of extra utilities (e.g., power lines, sewer connections).

4.8.4 Availability of Prospective Technologies

Respondents shall assess whether specific technologies are generally available for use at the Facility. The EE/CA should indicate when a technology would be available for full-scale use.

4.9 State Acceptance

This factor evaluates the technical and administrative issues the State of Ohio may have regarding each of the alternatives. U.S. EPA will consider Ohio's concerns before recommending an alternative and making a final selection.

4.10 Community Acceptance

This assessment shall evaluate the issues and concerns that the affected public may have regarding each of the alternatives. As with State acceptance, the community acceptance of an alternative will be considered when U.S. EPA makes a recommendation of an alternative and when U.S. EPA makes a final selection.

4.11 Cost

Each removal action alternative shall be evaluated to determine projected costs. Each evaluation should include a comparison of capital and PRSC costs. Present worth costs should also be projected. Capital and PRSC costs include:

4.11.1 Direct Capital Costs

- Construction Costs
- Equipment and material costs
- Land and Facility acquisition costs
- Buildings and services costs
- Relocation expenses

- Transport and disposal costs
- Analytical costs
- Contingency allowances
- Treatment and operating costs

4.11.2 Indirect Capital Costs

- Engineering and design expenses
- Legal fees and license or permit costs
- Start-up and shakedown costs

4.11.3 Annual PRSC Costs

- Operational costs
- Maintenance costs
- Auxiliary materials and energy.

5. Comparative Analysis of Removal Action Alternatives

The contractor shall highlight the advantages and disadvantages among the alternatives. Only a brief narrative section is required for this section and comparison tables should be utilized to the maximum extent possible in order to simplify the analysis. Objectives/Criteria to be used in the Comparative Analysis include:

1. *Effectiveness*

Protectiveness

a. Protective of public health and community
b. Protective of workers during implementation
c. Protective of the environment
d. Complies with ARARs

Ability to Achieve Removal Objectives

a. Level of treatment/containment expected to be achieved
b. No residual effect concerns
c. Will maintain control until long-term solution implemented (if applicable)

2. *Implementability*

Technical Feasibility

a. Constructability and operational considerations
b. Demonstrated performance/useful life

c. Adaptable to environmental conditions
d. Contributes to remedial performance
e. Can be implemented in 1 year

Availability
a. Availability of equipment
b. Availability of personnel and services
c. Availability of outside laboratory testing capacity
d. Availability of off-Site treatment and disposal
e. Availability of PRSC

Administrative Feasibility
a. Permits required
b. Easements or right-of-ways required
c. Impact on adjoining property
d. Ability to acquire institutional controls
e. Likelihood of obtaining waiver from statutory limits (if needed)

3. Cost
a. Capital Cost
b. PRSC Cost
c. Present Worth Cost

6. Recommend Removal Action Alternative

The Respondents shall include a section which recommends a removal action based on the comparative analysis in the previous section and describe the reasons for the recommendation. This description shall also summarize the EE/CA. This secton shall clearly describe why the alternative is being recommended. The selection of a recommended removal alternative shall be made following discussions with the U.S. EPA RPM. U.S. EPA shall select the recommended alternative.

IV. DELIVERABLES

The deliverables required are as follows:

DOCUMENT	DUE DATE
EE/CA Work Plan	30 calendar days after effective date of Administrative Order by Consent

Draft EE/CA Support Sampling Plan	15 calendar days after U.S. EPA approval of EE/CA Work Plan or revised EE/CA Work Plan
Final EE/CA Support Sampling Plan	15 calendar days after receipt of U.S. EPA comments regarding Draft EE/CA Support Sampling Plan
EE/CA Data Report	Pursuant to schedule in EE/CA Support Sampling Plan
Draft EE/CA Report	30 calendar days after U.S. EPA approval of EE/CA Data Report or revised EE/CA Data Report
Final EE/CA Report	30 calendar days after receipt of U.S. EPA comments regarding Draft EE/CA Report

ATTACHMENT A

Settling Defendants	
#	Facility Name
1	Alcolac, Inc.
2	Alpha Metals, Inc.
3	America Matsushita Electronics Company
4	American National Can Company
5	American Spring Wire Corporation
6	Anzon, Inc.
7	Arcon Equipment Inc.
8	Atlantic Battery
9	ATR Wire & Cable Co., Inc.
10	Ball Corporation (Heekin Can)
11	Central Can Company
12	Crown Battery Manufacturing Company
13	Crown Cork and Seal Company, Inc. (for itself and Davies Can Company)
14	E.I. du Pont de Nemours and Company
15	Estwing Manufacturing Company
16	Federated-Fry Metals, Inc.
17	Fusion, Inc.
18	General Dynamics Corporation (for Electric Boat Corporation)
19	GHR Recycling, Inc.
20	The Goodyear Tire & Rubber Company
21	Gould Electronics, Inc.
22	GTI Corporation
23	Johnson Controls Battery Group, Inc.

	Settling Defendants
24	Lenox, Inc.
25	Mark C. Pope Associates, Inc.
26	Miami Industrial Trucks
27	Morgan, Matroc Inc. Electro Ceramics Division
28	NL Industries, Inc.
29	New York State Thruway Authority
30	OHM Resource Recovery Corporation (n/k/a CWM Resource Management, Inc.)
31	Owens-Illinois, Inc.
32	Techneglas, Inc.
33	Phillips Display Components Company
34	Piezo Kinetics, Inc.
35	Power Battery
36	RelTec Corporation (for Lorain Products)
37	Sam Allen & Son, Inc. (n/k/a NewmanAllen Enterprises, Inc.)
38	Seneca Wire Manufacturing Company
39	Service Parts & Exchange, Inc.
40	Sony Electronics, Inc.
41	St. George Crystal
42	Superior Chemical and Supply Company
43	Teknor Apex Company
44	Turbine Engine Components Textron (for AirFoil Forging and Textron)
45	Thompson Consumer Electronics, Inc.
46	Toshiba Display Devices
47	Unisys
48	United States Can Company
49	U.S. Steel

	Settling Defendants
50	Axsys Technologies, Inc. (f/k/a Vernitron Corporation)
51	Victory White Metal Company
52	Zenith Electronics Corporation (Rauland Division)

CONFIDENTIAL INFORMATION OF ENTACT

Entact uses proprietary technology in additive and treatment processing to achieve its fixation and permeability results. Patents have either been issued or are pending.